

In This Issue—Too Many Comebacks

# MOTOR AGE

Vol. L  
Number 6

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE  
CHICAGO, AUGUST 12, 1926

Thirty-five Cents a Copy  
Three Dollars a Year

*"If the car had been on the market for the past two or three years it could not have proven more free from troubles"—*

*That's the judgment of*  
**George G. Norwood, President**  
**NORWOOD BROS., Inc.**  
Baltimore

**V**ETERAN MERCHANTS of the automobile field, familiar with the usual first-year troubles of new cars, are invariably astonished at the way in which the New Safety Stutz runs counter to tradition.

They are pleasantly, and profitably, surprised to find that the car goes serenely along, month after month, without mechanical trouble. As one man said, "The New Stutz doesn't seem to know that it is a new car."

We want to hear from good distributors and dealers who want to make sales, get profits, and keep their profits after they get them.

**STUTZ MOTOR CAR CO.**  
of AMERICA, Inc., Indianapolis

Stutz Motor Car Co. of America, Inc.,  
Indianapolis,  
Indiana.

Dear Sirs:

Never in all of my experience, which dates back to 1905, have I seen a new car come on the market which has been so near correct and has been so free from minor adjustments. If the car had been on the market for the past two or three years it could not have proven more free from troubles and small service work.

I can honestly repeat the statement that I made at the factory after three days' careful inspection, that when the new models were presented they were as near perfect as an automobile could be and there is not a single improvement that I could suggest.

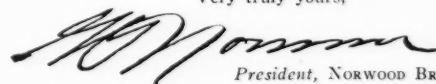
The motor has given wonderful satisfaction in smoothness and power and in its absolute lack of vibration; it gives you a real thrill to ride behind it. The brakes are one of the most wonderful improvements ever made on an automobile, and the worm drive is so superior that there is nothing to argue about.

All of my owners are wonderfully enthusiastic and extremely proud about their New Stutz. Our automobile is finding its way to the homes of the best people in Baltimore. Some of these families have owned nothing but \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ over a number of years, but the beauty of the New Stutz appeals to everybody.

Our entire organization is 100% sold on the New Stutz and the factory organization back of it; so much so that I am making arrangements next week to give up the other line, which we have handled for the past four years and doing quite a large volume of business. When one's heart is set on Stutz and the company back of it, it's rather a hard job to sell something else.

I want to take this opportunity of thanking you for the wonderful co-operation rendered us. In spite of rush conditions your promptness in co-operating with us has been most gratifying. The account has proven most satisfactory financially and will surely prove the same to any other distributor provided he is willing to work, because the New Stutz offers less sales resistance than any other high-grade car on the market. We surely have more to sell for less money and today we are leaders.

Very truly yours,



President, NORWOOD BROS., Inc.

*New*  
**SAFETY STUTZ**

# MANLEY WRECKING CRANES

**Watch for them on the road**

*Manley Wrecking Cranes are Business Getters*

THE ILLUSTRATIONS  
TELL THEIR  
OWN STORY

GET A  
MANLEY



*This is a  
Manley Year*

For new 1926 Catalog describing the entire Manley line write to  
**MANLEY MFG. CO., YORK, PA.**

MANLEY CRANES ARE AVAILABLE IN  
THE FOLLOWING SIZES:

No. 101, 2½ Ton . . . . .	\$100
No. 107, 3½ Ton . . . . .	\$135
No. 105, 5 Ton . . . . .	\$275

Order from your jobber NOW and  
avoid delay in delivery.



# "Used car sales control new car sales"

—says Edward S. Jordan

QUOTING MR. JORDAN FURTHER:—"If anyone asks about the quantity of production which will be maintained in the industry in years to come, the answer is very simple. The number of cars produced will exactly equal the number of second-hand cars that can be merchandised at a profit by the dealers."\*

To get rid of used cars (trade-ins) at a profit is quite a problem. People shy away from cars

with battered and weather-beaten finishes—they want good-looking cars, almost regardless of mechanical conditions.

With an Opex Lacquer finish you can get better prices for your used cars as well as sell them faster.

A Lacquer finishing booth takes up little space—four or five cars can be finished in a day—with no more fire hazard than the gasoline in your tanks—and, such a booth does not require a large investment.

Opex, the perfected lacquer, dries in 30 minutes. It can be applied economically over old finishes and it produces a finish that looks like a factory job. No especial skill is required to put on a good job.

We want to tell you more about this proposition. It should mean a lot to you. Send coupon or write.

\* Reprinted from an article in "Finance and Industry", by Edward S. Jordan, entitled "Where do we go from here."



THE SHERWIN-WILLIAMS Co.,  
420 Canal Rd., Cleveland, Ohio.

Supply us, entirely without obligation, full details of your Opex perfected lacquer proposition.

Name.....  
Address.....Place.....

Illustrations such as this are appearing periodically in *The Saturday Evening Post* and are broadcasting the story of Opex throughout the nation. Consumer demand is the dealer's cue.

**SHERWIN-**  
PAINTS, VARNISHES



**WILLIAMS**  
AND LACQUERS

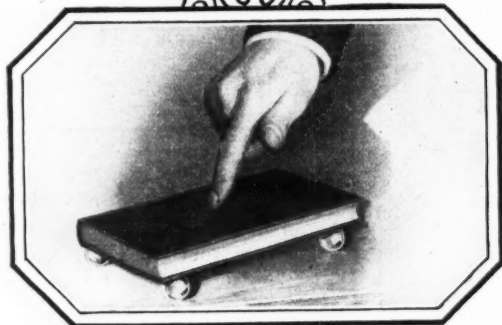
## Let's Get Down to Fundamentals



Push a book along the table. Note the drag due to the friction of sliding one surface over the other.



Place the book on pencils. It moves easier because *rolling* contact is substituted for sliding friction. But note the tendency of the rollers to change direction—and then to resist movement in the original direction.



Place the book on balls. The slightest touch starts the book across the table. And note particularly that the balls show no tendency to change the direction in which you are moving the book. Nothing rolls so easily, so true, so free of friction as a ball. *So it is with the New Departure Ball Bearing.*

# New Departure Quality Ball Bearings



# MOTOR AGE

Reg. U. S. Pat. Office

Vol. I

No. 6

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## CONTENTS

Do It Right—The First Time.....	9
<i>By Sam Shelton</i>	
All-round Service Built This Business.....	10
<i>By H. Lionel Williams</i>	
Growler Armature Testing Explained.....	12
<i>By A. H. Packer</i>	
Experience Beats Youth in Coast Sales Contest.....	14
Small City Ford Dealer Pays Salaries to Salesmen.....	15
<i>By H. Lionel Williams</i>	
Hypoid Noiseless Gears Used in Axle of New Packard.....	16
<i>By L. S. Gillette</i>	
Three New Body Styles in Star's Improved Line of Fours and Sixes.....	20
<i>By Donald Blanchard</i>	
Chandler Line Now Includes Standard, Special and Big Six Models.....	22
New James Valve.....	24
MOTOR AGE'S Picture Page.....	25
New Accessory Items.....	26
The Readers' Clearing House.....	27
Letters to the Editor.....	32
New Shop Equipment.....	33
Editorial.....	35
Review of Trade Conditions.....	36
News of Automotive Factories.....	38
Trade Association Activities.....	42
Coming Motor Events.....	43
Specifications.....	44
CLASSIFIED ADVERTISING SECTION.....	89
INDEX TO ADVERTISERS.....	90-91

MOTOR AGE is published every Thursday by

## CHILTON CLASS JOURNAL COMPANY

Mallers Building, 5 South Wabash Avenue, Chicago

C. A. MUSSELMAN, President and General Manager

J. S. HILDRETH, Vice-Pres. and Director of Sales

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Cable Address: Motage, Chicago

Telephone: Central 7045

## OFFICES

New York—U. P. C. Bldg., 239 West 39th St.; Phone

Pennsylvania 0080.

Detroit—7338 Woodward Ave.; Phone Empire 4890.

Cleveland—540 Guardian Bldg.; Phone Main 6860.

Philadelphia—56th and Chestnut Sts.; Phone Sherwood 1424.

Indianapolis—519 Merchants Bank Bldg.; Phone Riley 3212.

Owned by United Publishers Corporation, 239 West 39th Street, New York; ANDREW C. PEARSON, Chairman Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer; H. J. REDFIELD, Secretary.

SUBSCRIPTION RATES: United States, Mexico and U. S. Possessions, \$3.00 per year; Canada, \$5.00 per year; all other countries in Postal Union, \$6.00 per year; single copies, 35 cents.

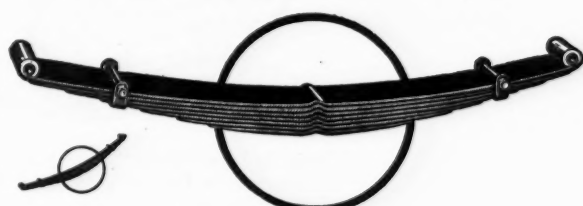
Member of the Audit Bureau of Circulations.  
Member, Associated Business Papers, Inc.

Copyright, 1926, by CHILTON CLASS JOURNAL COMPANY

Subscriptions accepted only from the Automotive Trade  
Entered as Second Class Matter, Sept. 19, 1899, at the Post Office at  
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# TUTHILL TITANIC

## ALLOY STEEL SPRINGS



## Here's a Real Testimonial!

"Tuthill Spring Company,  
Gentlemen:

You probably will be interested in knowing that I have had a set of your Titanic hump center springs on my Available 2½ ton truck for over seven years and the springs have never been off the truck for any reason, although I regularly carry from five to six tons of metal plates and sheets.

Nobody can ever sell me anything but Titanic Springs for my trucks.

Yours truly,  
D. SOLTO, Chicago, Ill."

Whether it's a truck, pleasure car or bus, Tuthill Titanics, with their famous unbreakable hump centers, make inseparable friends. Thousands of other motorists talk just like Mr. Solto — nothing but a Titanic will do!

Think of what that means to you.

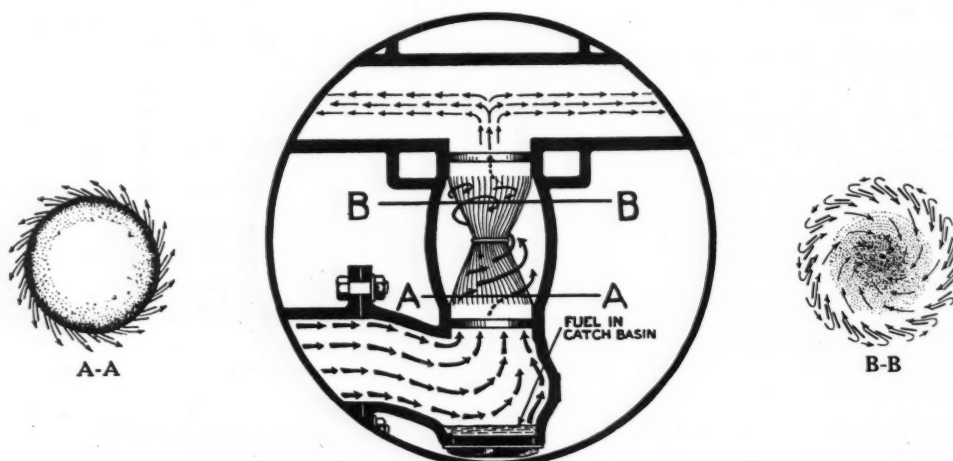
Your discount is very liberal and you can build a more profitable spring business. And when you please your customers with Titanics they are going to depend upon you for other reliable service work.

Write Today for the Tuthill  
Service Station Plan

TUTHILL SPRING COMPANY  
DEPT. 879 • 760 POLK STREET • CHICAGO, ILL.

ESTABLISHED 1880

Installation time from  
10 to 20 Minutes



This is the "BAT" Suction Super-Charger  
A Marvel in Design and Fine Workmanship.  
Cuts A-A and B-B Show Handling of Fuel  
Passing Through.



## The "BAT" Suction Super-Charger Astonishes Experts

The simplicity of the "BAT" Suction Super-Charger and the scope of its performance have brought it to the attention of the engineers of the industry as well as the dealers and service men.

Experts are astonished at its record of performance.

### *"Functions When the Engine Breathes"*

The "BAT" Suction Super-Charger starts to operate with the first turn of the engine, and functions continuously as long as the engine runs, regardless of speed.

It refines the out-put of the carburetor; charges all cylinders evenly with a perfect homogeneous combustible mixture; makes cold motors start; minimizes crankcase oil dilution; eliminates back-fire; operates successfully on new cars and rejuvenates old ones.

Its market in the automotive field is practically unlimited—and the prices range as low as \$7.50.

*Ask us for complete details.*

**P. H. Webber Co.**

Racine

Racine Industrial Plant Bldg. No. 12

Wisconsin



MANUFACTURED AND SOLD UNDER LICENSE OF P. J. F. BATENBURG, RACINE, WIS.



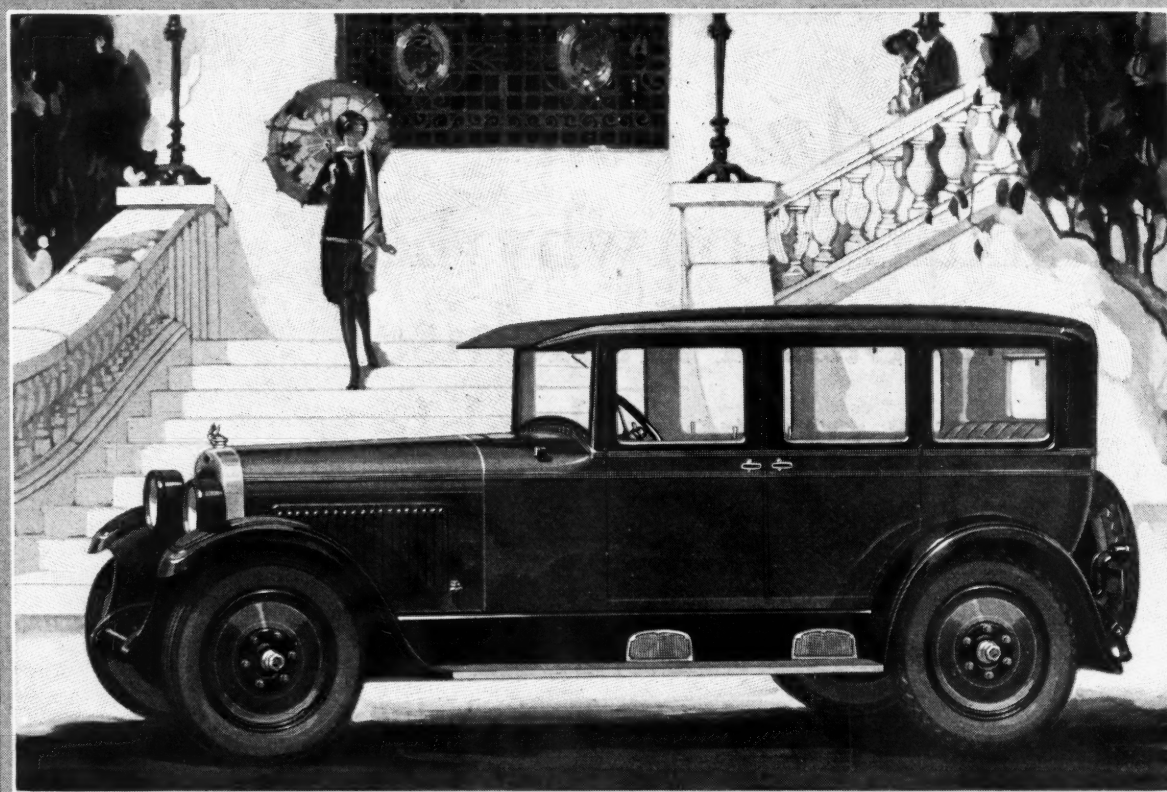
—*And now*  
a sixth reason why the  
Studebaker franchise  
grows more valuable  
every day:

1. One-Profit Value
2. Unit-Built Construction
3. Always Kept Up-to-Date
4. Used Car Pledge
5. Low Time-Payment Rates
- ✓ 6. *Custom Car Luxury*  
*without Custom Car Cost*

THE addition of Studebaker Custom Sedans to the Studebaker line further increases the money-making possibilities of the Studebaker franchise. Live dealers—located at points where Studebaker is not represented or where, in their opinion, inadequate representation exists—should communicate with the factory at once regarding the sales rights for Studebaker cars.

THE STUDEBAKER CORPORATION OF AMERICA  
SOUTH BEND, INDIANA

S T U D E B A K E R



# NASH

*Leads the World in Motor Car Value*

## Introducing *the newly refined Advanced Six Nash 4-Door Sedan at \$1525*

*f.o.b. factory*

**Refined Motor with**

**7-Bearing Crankshaft**

**Matchless Power-Smoothness**

**Supreme Quietness**

**25% More Power**

**23% Faster Acceleration**

**New Instrument Board**

**All Instruments in**

**Single Panel under Glass**

**Seat Upholstery of Genuine**

**Chase Velmo Mohair Velvet**

**New-type "Crankcase" Breather Full Force-feed Lubrication**

**Motor Heat Control by Thermostatic Water Regulation**

**Double Filament Headlights**

**New Winged Radiator Cap**

**New-type Motor Muffler**

**Electric Clock**

**Hydrostatic Gas Gauge**

**Air Cleaner**

**Oil Purifier**

**Oil Screen "Agitator"**

**Gasoline Filter**

**Four-wheel Brakes**

**Five Disc Wheels**



**60%** of Tire Chain Sales  
are in towns of 10,000  
or less



**Here is the place to buy**



—and consequently the place to sell them, because automotive dealers in smaller towns have before them the biggest market for tire chains in the world!

And this is particularly true with WESCO Tire Chains, which are packed in heavy, full telescope, fibre cartons neatly labeled. They are easier to stock, easier to display, attractive on the shelves, and an incentive for your customers to buy.

Every car owner needs tire chains. Every one who is not supplied—and there always thousands of them—is a prospect for WESCO. Arrange a few cartons attractively on your counter, or make a window display. You'll be surprised how fast they sell.

There's an opportunity yet to do some business with tourists, and it's time now to get started on Fall and Winter sales.

Ask your nearest hardware jobber or  
write us direct

**WESTERN CHAIN CO.**

CHICAGO

U. S. A.



# Chrysler Alone Offers Standardized Quality

*An important new principle, which is bound to affect vitally the profits of every motor car dealer*

Walter P. Chrysler's principle of standardized quality manufacture is revolutionizing the buying and selling of fine cars today.

For, at one step, it eliminates "purchaser's risk" . . . ends the buyer's and seller's doubts and fears as to quality . . . makes possible the sale of either the lowest-priced or the highest-priced Chrysler with positive knowledge that the quality is equally assured and the value is supreme in its class.

## *An Unique Achievement*

Leading manufacturers have been striving for years to achieve this absolute evenness of quality.

But Chrysler alone has achieved it . . . translated it into fact by an extraordinarily complete coordination of engineering and manufacturing resources.

Chrysler standardization of quality goes back to the sources of raw material; it governs the very minutest operation; it makes certain that every unit is produced with the finest precision standards under the most rigid inspection;

it even moulds the manufacture of accessories.

Of course, Chrysler models to meet the four great quality markets differ in price, in size of chassis, in richness of appointments, in speed and power—the model numbers representing miles per hour—but all are basically the same in rigid adherence to the same law of quality.

## *Advantages for the Dealer*

Obviously, cars bearing one name . . . built by one organization . . . under one all-embracing system of standardized quality manufacture . . . must be essentially fine to a degree beyond comparison with cars made under ordinary methods.

These superiorities of Chrysler Standardized Quality are superiorities in which every dealer concerned with making money is vitally interested.

Write us for further details as to what Chrysler Standardized Quality means to you in added profits.

CHRYSLER SALES CORPORATION, DETROIT, MICHIGAN  
CHRYSLER CORPORATION OF CANADA, LIMITED, WINDSOR, ONTARIO

# CHRYSLER



# Do It Right — the First Time

By SAM SHELTON

**H**IGHEST praise is due the many sincere service shops throughout the country that are earnestly striving to reduce the cost and add to the joy of automobile ownership by giving honest and dependable maintenance service that satisfies the car owner, at a reasonable cost.

These shops are not operated as philanthropic institutions, but as real business establishments where an honest service is rendered for a fair price.

But in this industry as in others, the shops giving superior service are in the minority and they must ever be held up as the ideal toward which thousands of other shops are working. In this industry the cases are rare in which it can be said that a service shop deliberately cheats a customer, but the fact remains that there are far too many instances of unsatisfactory service caused either by incompetency of workmen, poor management, or inadequate equipment, or a combination of these faults.

Although the industry has advanced remarkably in the design of vehicles, and in its merchandising methods we still hear too often the bitter complaints of car owners who have had distressing experiences with service shops.

In very few of these cases can the fault be attributed to any deliberate purpose on the part of the shop management to skimp or slight the work, but if we are ever to correct this evil we must begin by

holding the shop management strictly responsible. Whatever the immediate cause of an unsatisfactory service job the responsibility ultimately must rest upon the management.

## Too Many Comebacks

Here is the record of three successive visits to service shops by the same car which was driven on an extensive tour.

1. Burned out connecting rod bearing. Car was taken to a shop in nearest town having a population of about 1500. After delay necessary to get the bearing from nearest jobbing center, 25 miles away, the repair was made. Bearing burned out again within few miles. Mechanic had not opened up stopped oil line. The job was not done right the first time. This was an independent garage.

2. Carbon cleaned, valves ground and tappets adjusted. This was done in an independent garage in town of 2500 population. Job was well done except that one tappet screw was left loose and caused a good deal of annoyance and trouble before it was fixed. The job was not done right the first time.

3. Brake band repaired. An anchoring lug pulled out of a brake band. It was repaired at an authorized service station for the particular make of car. Within a few miles of driving it pulled out again. The job was done over by the service station without charge, although somewhat reluctantly, and was then satisfactory. It was not done right the first time.

The good service shops that are successfully trying to wipe out such records as this deserve praise and are reaping their reward in profits.

And if the management is determined to remove the cause of complaint, build up customer good will, and establish a profitable service business, its course is straight and clear. It must begin with and adhere to the purpose stated in these few words:

**DO IT RIGHT — THE FIRST TIME.**

A repair or maintenance job done right the first time will give satisfaction and will not have to be done over.

If a shop expects to do a job right—the first time—it must have honest and competent management, intelligent and capable mechanics, good equipment, and a rigid policy of guaranteeing its work and making good any defect at the expense of the party responsible for it.

The doing of a job right—the first time—appears to be a simple matter. It means first of all intelligent diagnosis of the trouble, and then the application of ordinary, every day, sound mechanical sense to its correction. "Maybe that will get by." It

doesn't get by. Nothing gets by that is not done right. There is no substitute for doing the job right—the first time.



# All-round

*Details make*

**I**N Nashville, Tennessee, with its population of 119,000 Cliff Hancock had built up a very respectable solid tire service business with a turnover of \$248,000 a year. Being dubious of the possibility of any further appreciable expansion, like Alexander, he looked around for fresh worlds to conquer.

In June last he took possession of premises on the main street, a block away from his solid tire business. Gasoline tanks were installed, the latest tire repair equipment put in, and a battery repair and charging room fitted up.

Between July 1st, 1925, and the end of January this year, his income from this source totalled no less than \$135,743.00 Here is where the money came from:

	Per cent
Pneumatic tires supply and repair.....	51.43
Gasoline and oil supply.....	32.04
Battery repair and charging.....	6.02
Vulcanizing .....	4.09
Service shop and press.....	3.33
Accessories sold.....	3.09

Total .....100.00

That all this business has been secured in the face of strong competition is due to the details of service that spell the difference between a satisfied and a pleased customer, and to the judicious advertising methods adopted. In a business such as this it is the details that count.

Seventeen hour service is maintained in the gasoline and oil department. These necessities are dispensed in an open "shed." Above the front part of this section is a tire and rim store, and at the back of the building are the tire repair departments, the offices, and the battery station, covering a total ground floor area of 11,400 square feet.

Ten negro boys under two white superintendents form the day staff of the gasoline and oil station. Three steel curbs guide incoming cars into position so that they can drive straight out through the opposite door. As soon as

a car comes in, one of the attendants, clad in regulation striped overalls, approaches and ascertains what type of service is required. If gasoline and oil he supplies the gasoline while another attendant wipes off the windshield and fills the radiator as a little courtesy. After pouring in the oil, any drippings are wiped off, and attention called to any apparent defects such as inoperative fan belts, etc.

Various kinds of gasoline are stored, totaling 3,800 gallons. Fifteen different kinds of oils, of various brands, insure the wants of practically every customer being met.

Until recently the gasoline tank fillers were located inside the shed. Moving them outside and bringing them to one common filler cap on the curb, has not only economized space at the pumps, while the tanks are being refilled, but has resulted in a saving of 50 per cent of the fire insurance rate.

About 30,000 gallons of gasoline is sold every month, every drop of which is brought to the station in Hancock's own 425-gallon tank truck. Apart from the saving in transportation cost that this tanker represents, it's advertising value is not inconsiderable.

One of the most important parts of this business, however, is the tire vulcanizing section. Inside, this is operated by three men, one vulcanizer, one assistant vulcanizer, and a tube boy. Road calls are attended to by seven boys with Ford service trucks. This is one part of the business that does not pay cash dividends, the cost of maintaining the runner service being charged off at \$600 a month.

Each of the Ford runners is equipped with a full set of tools, jacks, gages, etc. and a tank containing sufficient compressed air at 140 pounds pressure to inflate five of the largest size in automobile tires. So that each of these vehicles can be kept constantly in service, spare engines and transmissions are kept ready for replacement.

In the repair shop, the equipment consists of a pair of compressors coupled to a large tank, one 9-tube vulcanizer,



# Service Built This Business

## the Difference

By H. LIONEL WILLIAMS

4 case vulcanizers, a water test tank, buffing machine, a decompressor and a tire stripper.

The last mentioned is a home-made affair that tears the rubber off casings, so that the liners can be cut up and made into boots at a cost of 2 cents apiece. These boots, after the application of a cement coating, sell for 75 cents each, and nine can be made from one old tire.

Scores of valve cores are saved by the use of the decompressor in emptying tubes of air after test and repair. Time is also saved because the tubes are properly emptied and can be quickly packed.

A Weaver tire spreader is kept in the reception shed so that covers can be examined in the presence of the customer. As the job is accepted a heavy green tag is tied to it, bearing the job number, name and address of the owner and details of the work to be done. If the job is a rush special an additional red tag is affixed. If it is a "wait" job a white tag is used in addition to the green, and if the tire is to be mounted a white tag is also attached to the rim.

For this kind of work Hancock recommends that the tags be of the best quality available, for much trouble is caused by flimsy tags getting wet, defaced and torn.

All tube jobs, except specials, are hung on a peg from which the tube boy removes them every 20 minutes. Whenever a job calls for a new tube, the old tube is always returned to the customer, a practice that has been found to save a lot of trouble.

The efficiency of Hancock's repair methods is indicated by the fact that out of 8100 repairs effected, only three jobs have been returned as defective. Here again it is attention to detail that counts. On vulcanized cases there are no

*Accessibility and order are featured in this battery repair room. Note the test bench in the foreground and the charging equipment immediately behind it.*

plain spots. Treads are molded in soapstone so that the vulcanized portion of the tread is no different from the rest.

Other details emphasized are the importance of buffing all parts for repair until thoroughly clean—even a finger print will prevent rubber adhering—and the use of cord fabric in cord tires.

A \$22,000 stock of new pneumatic tires is carried, representative examples of which are placed in a special rack for examination and choice by customers and quick service in the shed. The rims stock is valued at \$1500 and these units are racked for easy location according to maker.

Fifty-two batteries can be charged at one time on the charging bench built by the battery department operators. This bench is a double-decker occupying the center of the floor, the bus bars being about two feet above each rack. At one end of the bench is the transformer set with the switchboard compactly arranged. At the other end is a lead-topped test bench equipped with a Portostat by which the dead, weak and shorting cells are quickly detected.

Along the walls are the incoming and outgoing battery racks, a lead sink with a steam nozzle connection, and a lead-topped work bench. Walls and floor are rendered acid-proof by a special paint.

Time loss has been reduced by the substitution for lead number tags of waxed card tags with rubber attaching bands. These are quickly snapped on the terminals without the job numbers having first to be punched on them.

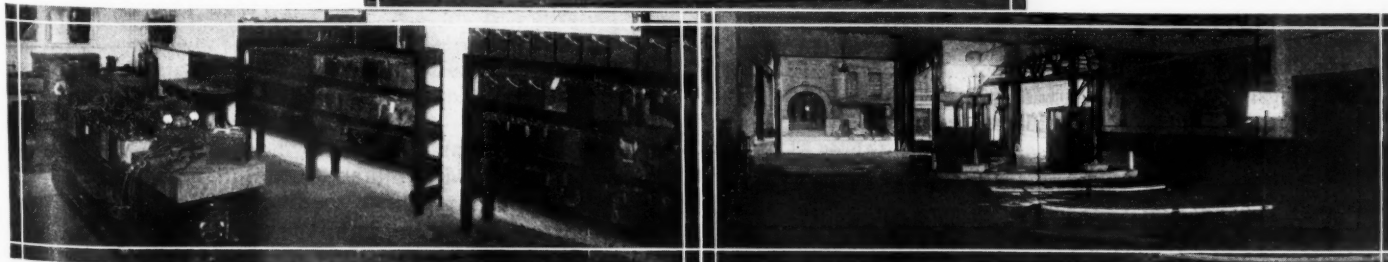
A four part battery record card is used (Fig. 2). When a job comes in, the office record portion is filed alphabetically, and the battery tag and shop record cards go with the battery into the shop. When the work is completed the shop card is returned to the office and filed behind the office record until the battery is delivered. The shop card is

*(Continued on page 34)*

Six lines bring in \$27,000 a year in this building



*Steel curbs guide automobiles into the gasoline and tire supply sections, and immediate attention prevents congestion*





# Growler Armature

BILL FIXIT STORY No. 23

PREVIOUS installments in this series by A. H. Packer were published March 19, April 2, April 16, May 7, May 21, June 18, July 30, August 13, September 3, September 24, October 22, December 10, and December 31, 1925; also February 11, March 11, April 1, April 22, May 20, June 10, July 1 and July 22, 1926.

SYNOPSIS: Bill Fixit's electrical trouble shooting men start on a trip in a Speedway car. They stop at various places along the way and in a mining community are robbed of all their money. This necessitates getting a job with the local electrician, to whom they give some helpful information gained in working in Bill Fixit's garage. Directional radio is used by government agents in locating a gang of crooks and the boys' money is recovered. The trip is continued and the night after leaving the mining town they stop with Barney Oldfield Smith, an amateur race driver and help him with a magneto job, where a new condenser is needed. After getting a number of electrical pointers from Bill Fixit's men, Barney decides to open an electrical shop. Several jobs come in, the service work increases and a stock of electrical accessories is added. At Barney's request, the Red Head explains simple generator principles and tells a few things about third brush generators and various conditions that will cause overheating.

"I'M doing government work this morning," said the Red Head, as the Valve Grinding Fiend and Barney came into the shop. Outside the door stood the old Speedway car in which Red and Valvy had started out from Westville. The hood was raised and Barney, taking a look, noticed the generator was gone.

"Off your own car," he said, as Red started to give the machine a motoring test and Valvy edged up closer to find out all about it.

"Yes," said Red. "I figured we better break away from here in spite of the fine time we have had and get back to Bill Fixit's shop. He will be needin' us this fall to start up the radio service department."

"I noticed you got a nice little lavender envelope the other day. Did Bill send you that?" Valvy wanted to know. But the Red Head merely gave him a scornful glance and went on with his work.

The motoring test seemed at first O. K. The machine turned evenly and slowly, but seemed to draw too much current. In fact, the meter showed a discharge of 10 amperes instead of 3 or 4 as would be the case with a good machine.

"I thought so," said Red, but did not say what he was thinking and the other boys became inquisitive.

"What is it?" said Barney. "Armature shorted?"

"We'll see in a minute," And Red proceeded to pull the machine apart so that the armature could be checked on the growler. But the growler test failed to show up any defects. As the armature was rotated the hack saw

*The Red Head Runs Across  
Grounded Brush Holders That  
Cast Suspicion on the Armature.  
He Then Explains How  
Growler Tests Are Made*

By A. H. PACKER

blade made no frantic endeavor to dance over any particular part of the armature and when it came to flashing between commutator bars, by shorting with the tip of the hacksaw blade, they all seemed to spark about the same.

"Too deep for me," said Valvy. "I always thought a heavy motoring current was a sure sign of a shorted armature."

"When accompanied by uneven running, yes," said Red. "But the ammeter reading is also unsteady in most cases. Now we will try something else," and the Red Head pulled off the commutator end bracket from the field frame and proceeded to test the brush holders for ground (Fig. 1), using 110 volt test points with a lamp in series with one lead.

This test told the story, for at each brush holder the test lamp would light up. "All three brush holders shorted," exclaimed Barney, who up to this time had been a silent watcher of the overhaul proceedings. "How did they all get that way at the same time?"

"Well, one of them is naturally grounded," said Red. "But the other main brush and the third brush are not supposed to be grounded. I have paid no attention to this machine, never clean it and now oil and carbon dust have made a nice conducting paste that has collected under the insulation and finally caused this trouble. We can study the trouble a little better by using a six-volt battery, now that

we know the brushes are grounded."

The battery was then used and caused the meter to read ten amperes leakage through the oil and carbon dust at the main brush holder, at the same time sending up a curl of smoke from the defective spot. The third brush when tested showed similar results but not quite so much smoke for it was not quite so oily.

"A thorough cleaning, and scraping clean any burnt part of the rocker ring, will fix it up," said Valvy, anxious

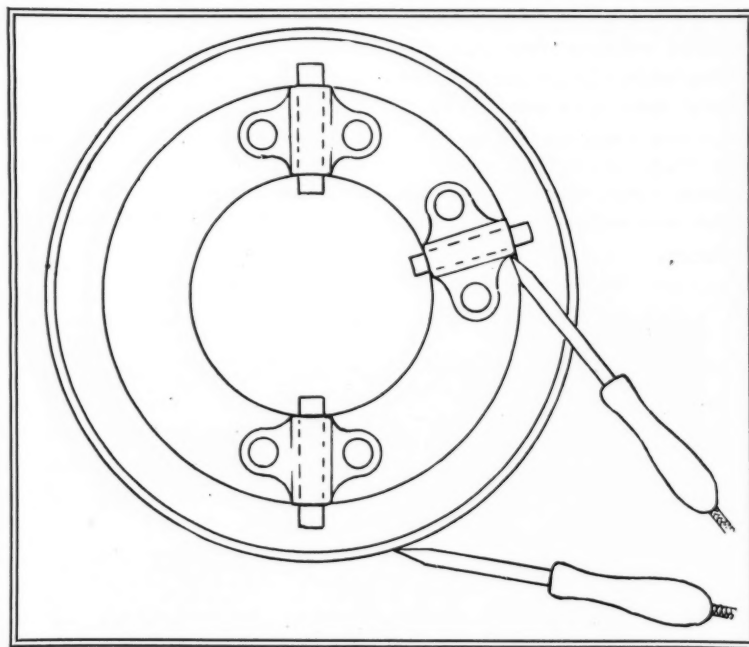


Fig. 1  
110 volt test points quickly locate brushes grounded with oil and carbon accumulation

# Testing Explained

to show that he knew a little something about the work.

"Right you are," said Red. "And since you are so clever suppose you finish the job. It's your car as much as mine and if you want to get home without cranking the engine you better do your share of the repair work."

Valvy grinned, wishing he had kept still, but agreed to finish up the generator job, just the same.

Barney, however, was still thinking about the armature test, for while he knew in a general way what happenend when a growler was used he figured that before Bill Fixit's boys left him, it would be wise to get a little more inside information. The Red Head was not in the least unwilling to make a few sketches and diagrams and when Valvy was through with his work the three boys sat down together to figure out just what happens when a growler is used in armature testing.

"It's hard as the dickens," said Red, "to show all the wires in the armature but we can make a sketch (Fig. 2) that will give a rough idea of what happens. The armature is made of iron and when placed in the growler completes the iron circuit so that the winding of the growler in carrying alternating current can send alternating magnetism, first one way and then the other way around in this iron path.

"This magnetism alternating back and forth through the iron of the armature will cut across and through the armature coils and will generate certain voltages in them. This is the point where we have to look closely to see what happens.

"In the sketch (Fig 2) we will assume that magnetism suddenly springs up at pole X, goes into the armature at coil H, through the iron, past coil F and back to pole Y. It would appear that the same amount of magnetism would pass coil H and coil F and that therefore these two coils would have the same voltage generated in them. In similar manner the voltage will be balanced in coils B and D and in A and E while the coils C and G will have no voltage generated in them.

"This action is similar to what takes place in the armature when in regular service, for in rotating, all the coils are generating voltages, but they balance up so as to prevent current flowing, except when brushes make contact to take current to some outside circuit.

"In similar manner the voltages generated in the growler balance each other when we have a good armature. Suppose, however, that in between commutator bars No. 1 and No. 8 we have a piece of metal jammed so that coil H is shorted on itself. Then even if its voltage is balanced in the main armature circuit by the voltage of coil F it will not prevent coil H circulating a local current through itself.

"This local current will have only the coil resistance to overcome and may, therefore, be fairly heavy so that there is considerable magnetic effect produced. This being the case it explains why the hack saw blade that we use to test with will dance around on the armature surface when a coil is shorted, for it is attracted and repelled by the alternating magnetism produced by the alternating current generated in the shorted coil."

At this point Valvy butted in and wanted to know how you could be sure that coils C and G would have no voltage generated in them.

"We do not know," said Red. "We do know, however, that the lines of force will generate current in the coils

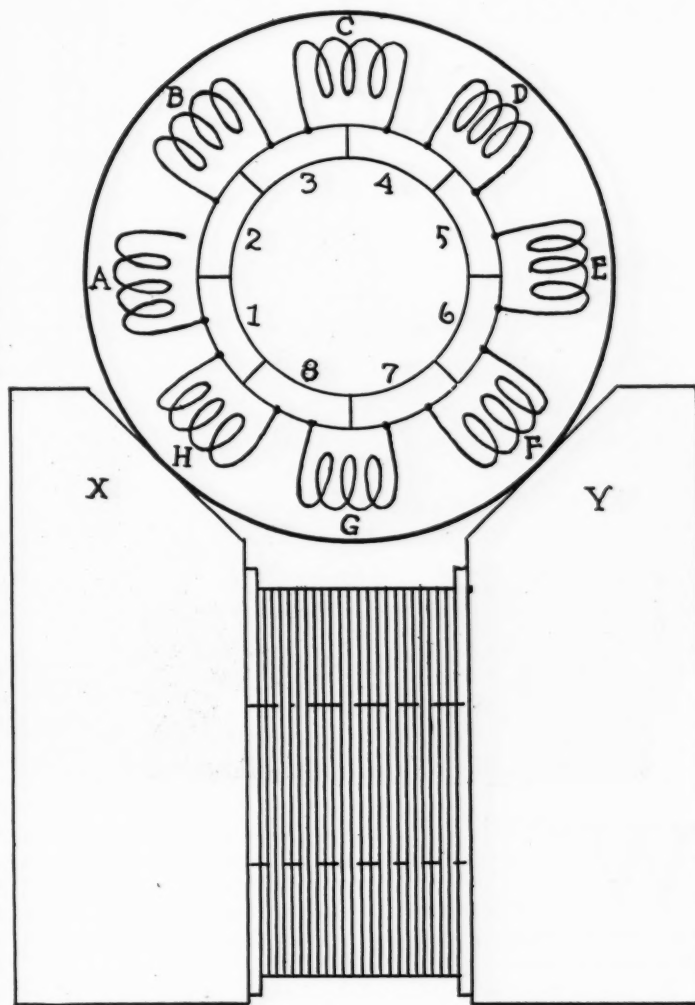


Fig. 2  
Simplified circuits of armature in a growler

through which they build up and that certain coils will be parallel with these lines of force or be in a neutral position so that they do not get any appreciable voltage. For this reason it does not make any difference which we consider the neutral coils and in an actual armature it will only be determined by experiment, for the position of these coils will vary with the type of winding. For our purpose we could consider that coils A and E get no voltage and that the three upper coils balance the voltage of the three lower ones. We would still have a circuit of balanced voltages."

"Then, how do you tell where to test?" Valvy persisted.

"One way is to take a good armature and put a drop of solder across two of the commutator bars. Then turn that armature in the growler and see where the hacksaw blade is caused to flutter, also turn the armature and see what position in the growler gives the most pronounced test. You can then remove the solder and test to see if there are any shorts, using the same relative position of the hacksaw blade where the best tests were obtained."

"That's pretty good dope on short circuits," said Barney. "Does the growler also check up the opens?"

(Continued on page 34)



# Experience Beats Youth in Coast Sales Contest



(Left) Tom Curley, salesman 28 years for Chester N. Weaver Co., Studebaker distributors, San Francisco, who won Studebaker's Pacific Coast sales sweepstakes. (Right) Chester N. Weaver, head of company bearing his name

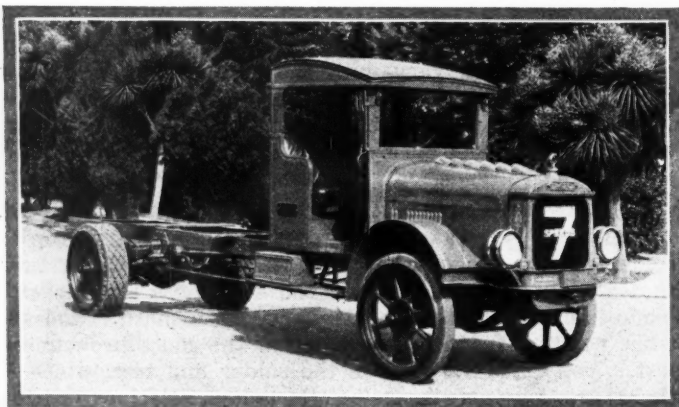
Banquet given Tom Curley as result of his high selling record in Studebaker's Pacific Coast sweepstakes. Curley is fifth from end at left

**W**INNING first place in sales in the Studebaker factory spring sweepstakes on the Pacific Coast, Tom Curley, veteran Studebaker salesman of the Chester N. Weaver Company, San Francisco distributors, added one more victory to his long list of achievements in selling Studebaker cars.

He holds the distinction of being the oldest automobile salesman in California handling the same line of merchandise continuously, having been associated with the sales of Studebaker products for the past 38 years in San Francisco. Not only is Mr. Curley one of the oldest salesmen on the coast but one of the best and his total sales of Studebaker cars reaches high figures.

Year after year Curley has been the star of the selling force of Chester N. Weaver Company and has been the winner of more sales contests than almost any other automobile salesman in the United States. He always ranks high in the national sales contests conducted by the Studebaker factory.

It has been 38 years since Mr. Curley first went to work for Studebaker when the company was manufacturing harness, wagons and buggies and the San Francisco store was at Market and Main Sts. He well remembers when Chester N. Weaver came out to San Francisco from Indiana 28 years ago to look after Studebaker interests associated with the Weaver Company ever since.



The new Fageol six-ton 85 h. p. truck, with seven speed transmission. It is known as Model 685 and differs from the other two other new Fageol trucks Nos. 370 and 485 only in size

## Fageol Announces Three New Truck Models

**T**HREE new truck models have been announced by the Fageol Motors Company, of Oakland, Cal. These models, known as 370, 485 and 685, are, respectively, a three-ton 70 horsepower, a four ton 85 horsepower and a six ton 85 horsepower. They are equipped for the first time in Fageol six-cylinder truck history with Waukesha engines and feature the Fageol 7-speed transmission.

It is pointed out that these models in no way supplant other heavy duty Fageols powered with Hall-Scott engines, merely providing Fageols for a wider field of usefulness which comprises equipment from two tons upwards for every trucking purpose.



# Small City Ford Dealer Pays Salaries to Salesmen

*Special Merchandising Problems of Rural Community Are Met by Training New Men in Their Particular Jobs*

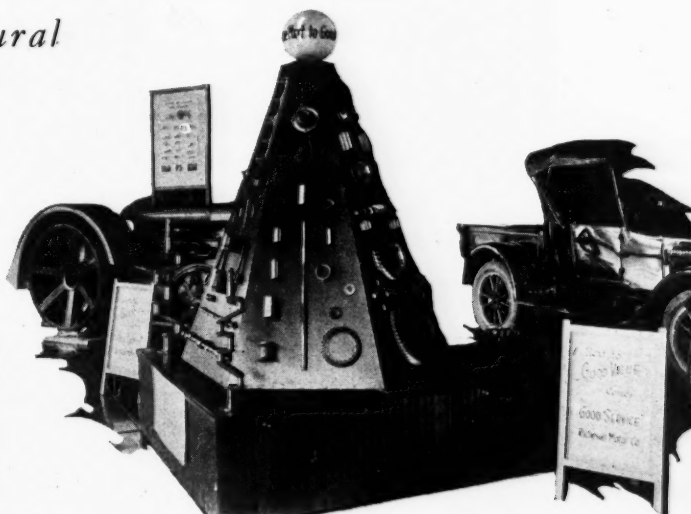
By H. LIONEL WILLIAMS

**S**ALESMEN are not paid commissions by the Richeson Motor Co of Bowling Green, Ky., Ford dealer. They get salaries which are based on their sales and possibilities. After a trial period each man is set a sales quota, which he has to maintain to hold his job. The basic reason for this practice is that in the smaller communities salesmen are made and not born, and more often than not they have to be trained by the company that engages them. Living is cheap and commissions are not the incentive to extra effort that they should be. Hence the flat rate remuneration which places the employer in a position of saying how much work a salesman must do to earn his money.

New salesmen are put on in the fall of the year and usually start on gas and oil sales until such time as they learn how to handle customers and make contacts. This latter is, according to W. H. Richeson the proprietor, the most important factor in selling motor vehicles in country districts. The salesman's first job is to sell himself to his prospects, and that means the developing of personality, tact, and a knowledge of the other man's business.

In farming and oil districts the prospects are particularly hard headed, all the more so for knowing little about motor vehicles in particular. So once a week the Richeson salesmen get a lesson on talking the language of their prospective customers.

A special salesman is employed for the truck department and the passenger car men turn their truck prospects



*Good display is as important in the small city as in the large. Richeson Motor Co. uses these devices to let the community know what it sells*

over to him. There are also two tractor salesmen who sell nothing but these units. Thus the selling is highly specialized. Why this should be so turns on the fact that Ford product salesmen now have to talk their product instead of just mentioning the name and indicating the price.

For the first time in its history the Ford automobile has to be sold on its mechanical advantages, and that is why W. H. Richeson takes such pains to insure that his men know the product they are selling.

The slogan of the Richeson company is "Next to Good Value Comes Good Service" and this is backed up by a fully equipped shop and a \$12,000 stock of parts.

In the repair shop, which measures 176 by 60 feet, is machine tool equipment costing \$5500, and small tools, benches, power motors, etc. worth \$3550.

Special benches are all located for special work. One bench is reserved for engine repairs, another for rear axles, and so on. Similarly the mechanics specialize on particular jobs, with special sets of tools for each department.

In 1925 this dealer establishment sold, in the four counties it covers 414 Ford cars, 20 trucks, 14 tractors, and two Lincoln cars, ending the financial period with an exceptionally small stock of traded in cars.

As the showrooms are on the main street of Bowling Green, advantage is taken of the location to make effective window displays. Tractors, trucks, and automobiles are given equal prominence, and a revolving stand has been arranged to display parts. All displays are changed every ten days.

That the showrooms are of some benefit was indicated when the new model Ford cars was exhibited. No less than 1054 persons inspected the vehicles on the floor, and from these were listed 200 live prospects.



*The repair department of Richeson Motor Co., Bowling Green, Ky.*

# Hypoid Noiseless Gears Used Packard



Improved line of Packard cars carry a new design of radiator. The inside contour of the shell has been smoothed out although the exterior characteristic shape is retained. This view of the eight cylinder sedan shows the full crowned fenders

**M**ARKING a new development in rear axle design, the introduction of hypoid gearing to give noiseless operation, longer life and increased load carrying capacity, is the outstanding feature of several important mechanical changes embodied in the improved line of Packard six and eight-cylinder cars.

The power output of both engines has been increased materially by the adoption of Nelson aluminum pistons having the Invar strut, redesigned combustion chamber, and new manifold. Crankshafts have been made heavier, the bore of the eight has been increased by  $\frac{1}{8}$  in., and new two plate clutches are employed on both chassis.

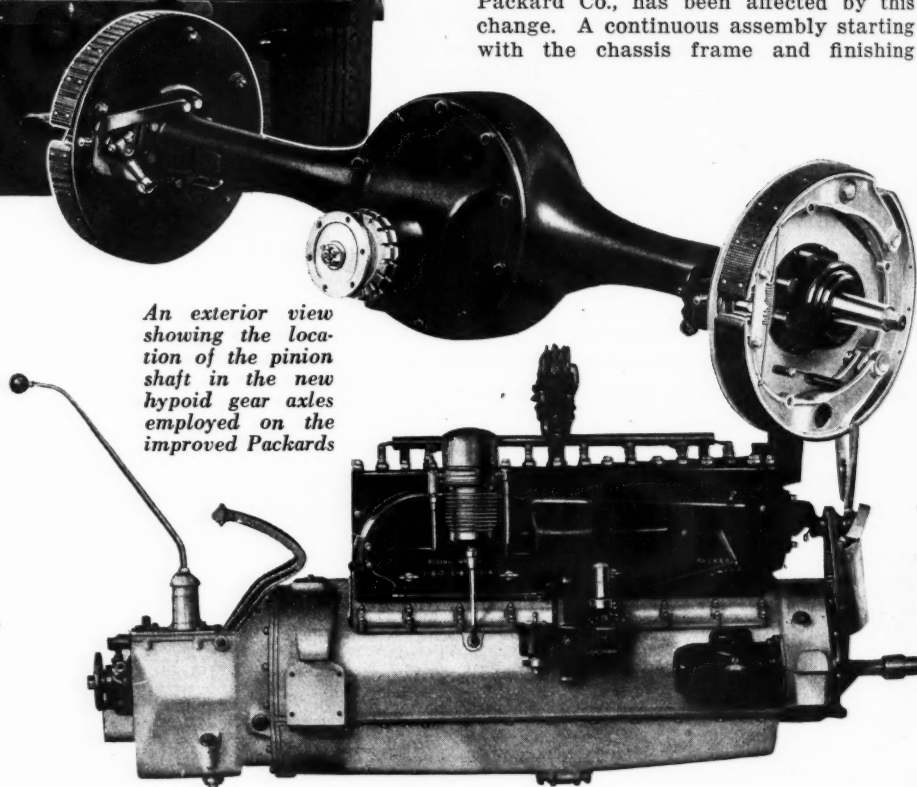
Coincident with the chassis changes, all closed bodies have been improved in design, chiefly by lowering the roof line, the adoption of the double belt moulding effect and the continuation of the roof over the windshield to form a permanent visor. The radiator design has been improved by smoothing out the inside contour of the shell, although the characteristic exterior curves are retained. Full crowned one-piece fenders are now standard equipment on the eight chassis.

*Other Improvements Include Increased Engine Power, Heavier Crankshafts, a New Clutch, Lower Bodies and Better Lines*

on the smaller chassis and \$3,850 on the eight. Only minor changes have been made on the open model bodies.

## Assembly Methods Changed

With the introduction of the improved line extensive changes have been made in the plant of the Packard Motor Co., several million dollars having been spent in the last few months in the remodeling and re-equipping the shops. The method of car assembly, long a feature of the Packard Co., has been affected by this change. A continuous assembly starting with the chassis frame and finishing



An exterior view showing the location of the pinion shaft in the new hypoid gear axles employed on the improved Packards

The above photograph shows the new Packard eight-cylinder engine

The line of bodies on both chassis is the same as before with all prices remaining unaltered except on four particular models which are revised as follows: Four-passenger coupe on both six and eight chassis increased \$100 to \$2,685 and \$4,750, respectively, with the four-passenger roadster on both chassis decreased \$100, making them now \$2,685

with the complete car ready for the road replaces the former method of assembling the chassis, then road testing the chassis and then mounting the body. A road test of several miles is given after the completed car leaves the assembly line and the car is then returned to the factory for a rigid inspection. At three distinct points in the completing and testing of the car the four-wheel brakes are inspected and adjusted by special equipment. One of the special items of



# in Axle of New Cars

By LESLIE S. GILLETTE

new equipment is the battery of gear cutting and lapping machines used in the production of the hypoid gears and supplied by the Gleason Works.

As a further development of spiral bevel gears, hypoid gears resemble bevel gears, but the axis of the pinion is offset from the axis of the gear and does not intersect it. The tooth action of the gears combine the rolling action of spiral bevel gears with the sliding action of worm gears thereby introducing a sliding element along the entire face of each tooth. Another way of expressing the hypoid gear action is by comparing the action of a sled runner passing over a rough surface where the runner tends to ride over the surface smoothly. The sliding action of the hypoid gears has the same effect in smoothing out the tooth engagements.

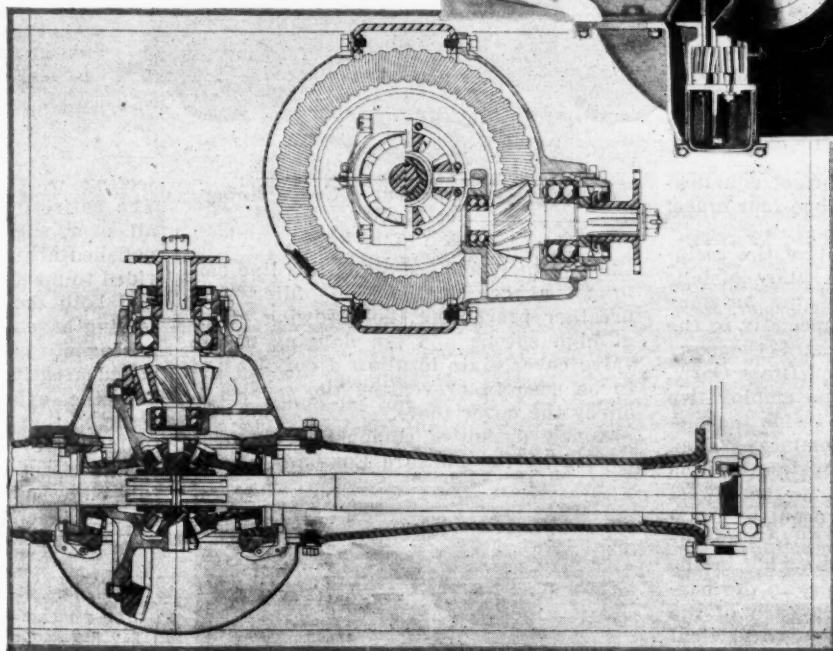
## Driving Pinion Is Lower

On the new Packard cars, the axis of the pinion is offset 2 in. below the axis of the gears and the effect of this arrangement can be seen clearly in the accompanying views. It will be noted that the drive for the rear axle is not through the center of the differential housing carrier as in the customary manner, but is set considerably below the normal center. The pinion is formed integral

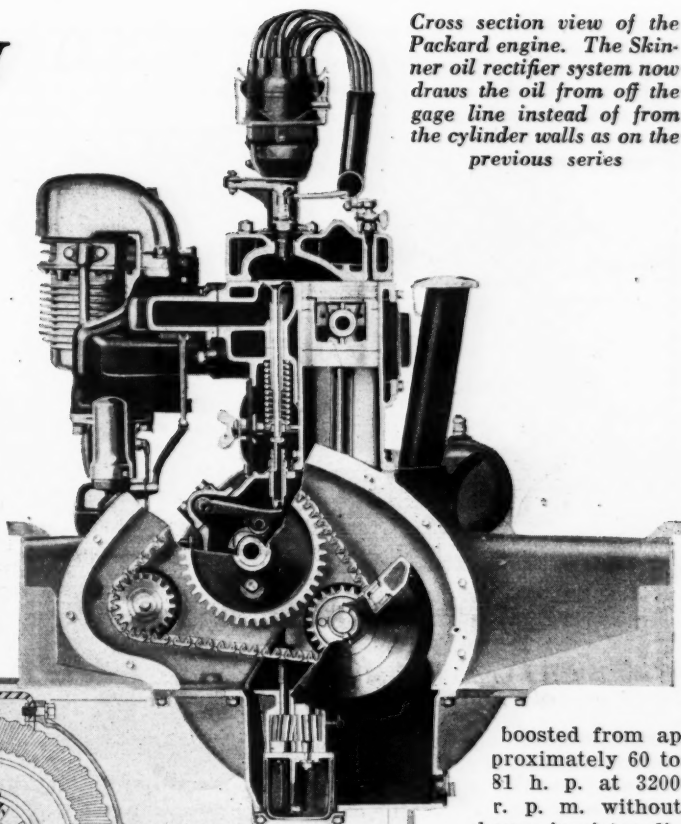
with the shaft and is supported both fore and aft on two double row ball bearings. The ring gear is attached to the differential carrier flange by a series of cap screws, thus insuring perfect alignment which is essential in the operation of hypoid gears. Two taper roller bearings are employed to carry the differential group in the customary manner.

With this type of axle design the end thrust on the front bearing is reduced considerably and longer life for all axle parts is claimed through the smoother operation. As in the previous Packard spiral bevel axles, the straddle type of mounting is employed and outside of the differential carrier, gears, and bearings, the axle is the same as before. The pressure angle of the hypoid gears is  $17\frac{1}{2}$  degrees with the spiral angle 35 per cent. Adjustment and maintenance of hypoid gears is very similar to that of spiral bevel gears, the amount of back lash being approximately the same. Packard

*Below: The adoption of hypoid gears in the rear axle is the outstanding change which has been made on the improved Packard line. This design is said to insure noiseless operation, longer life and increased load carrying capacity*



*Cross section view of the Packard engine. The Skinner oil rectifier system now draws the oil from off the gage line instead of from the cylinder walls as on the previous series*



boosted from approximately 60 to 81 h. p. at 3200 r. p. m. without change in piston displacement, while the larger engine now rates at 109 h. p. at 3200 r. p. m. as compared with the previous 80 h. p. The bore of the larger engine, however, has been increased by  $\frac{1}{8}$  to  $3\frac{1}{2}$  in. (same now as the six) to increase the low speed torque and facilitate production.

With this increased power, the N. A. C. C. h. p. being 39.20, the improved models are the fastest passenger cars built by

is the first automobile company to put the hypoid gears into practical production and experiments on the roads with these axles have been in progress for the last year.

With the increased engine performance it has been possible to use lower gear ratios in the rear axle. Three ratios are provided for on each chassis as follows:

	Low	Standard	High
Six .....	5 to 1	42-3 to 1	41-3 to 1
Eight .....	42-3 to 1	41-3 to 1	4 to 1

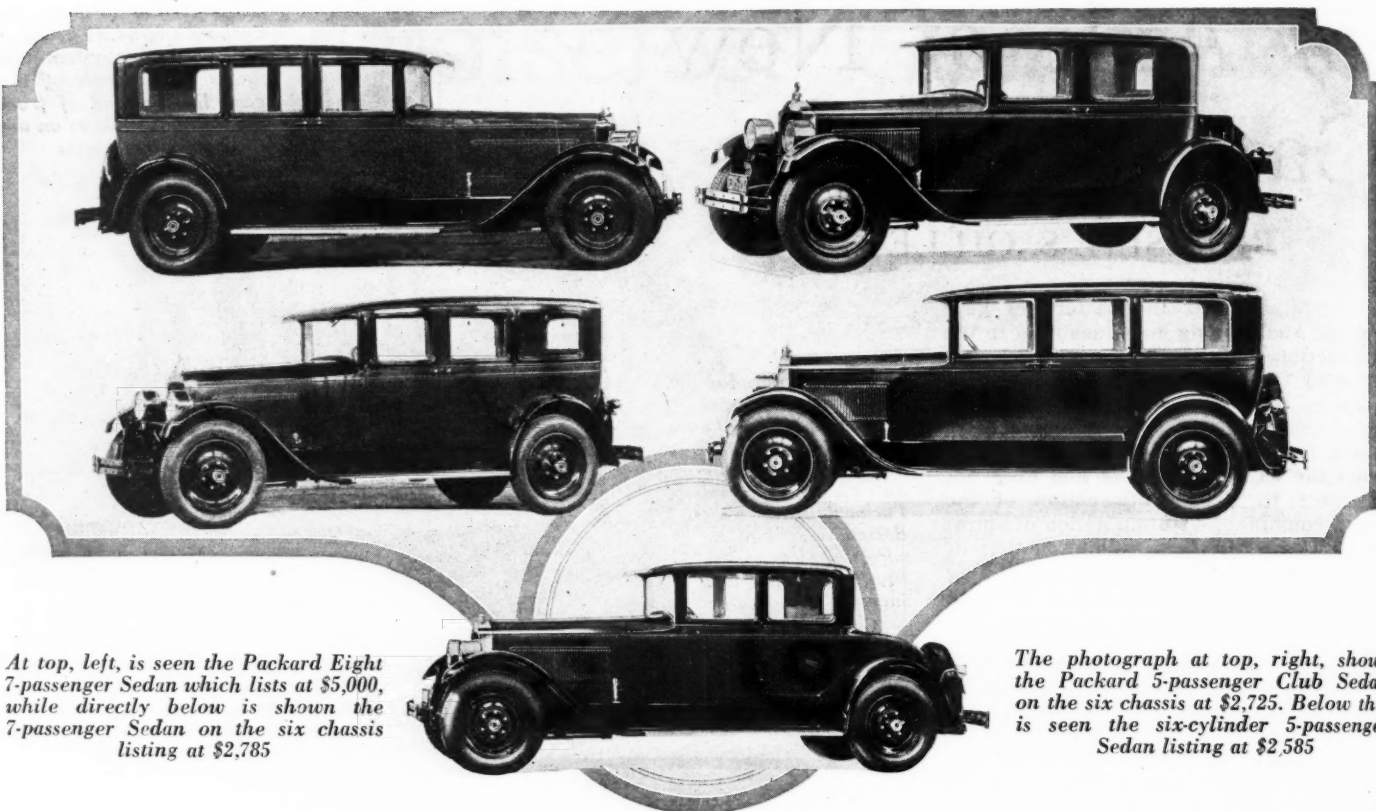
On the previous models the standard ratios on the six and eight cars were  $5\frac{1}{2}$  to 1 and  $4\frac{2}{3}$  to 1, respectively. Due to the increased torque of the new engine the cars show much better agility at low speeds and easier handling in traffic.

## Greater Power Output

Through several changes in both six and eight engines, the power output has been increased materially. On the smaller engine, the b. h. p. has been

Packard. Both models are capable now of an unusually high road speed which resolves itself in allowing a high rate of touring speed to be maintained without fatigue. With the object of ascertaining the maximum speed on the improved "eights" the writer was permitted to drive one of the new seven passenger sedans. Due to the nature of the roads near the city it was impossible to reach top speed, but a rate of 86 m. p. h. was attained without any effort or feeling of unsteadiness. On slowing down to what was thought to be a normal comfortable touring speed with the throttle about one-third open, the speedometer showed 55 m. p. h. The acceleration from this point seemed to be as quick as accelerating from 20 m. p. h. A speed of 58 m. p. h. was attained in second gear without any undue noise arising from the transmission while the car kept in a perfect straight line when the brakes were applied hard





At top, left, is seen the Packard Eight 7-passenger Sedan which lists at \$5,000, while directly below is shown the 7-passenger Sedan on the six chassis listing at \$2,785

The photograph at top, right, shows the Packard 5-passenger Club Sedan on the six chassis at \$2,725. Below this is seen the six-cylinder 5-passenger Sedan listing at \$2,585

at 75 m. p. h. showing perfect equalization of the new internal shoe four wheel brakes.

In lightening the weight of the reciprocating parts, aluminum alloy pistons are employed in place of the previous cast iron pistons. Made specially to the specifications of the Packard Company by the Bohn Aluminum and Brass Corp., the new light alloy pistons employ two Invar steel struts located inside the piston skirt to control thermal expansion. The "cut-loose" for the piston head is provided for by saw cuts in the lowest or third piston ring groove on the bearing side. In this groove is fitted a Teetor oil control ring and the saw cuts in the groove act as oil relief holes in the customary type of piston. On each of the bearing sides of the piston two vertical relief saw cuts are made while the skirt is slotted on either side below the pin center. With the honed cylinder bores and the special piston design, the pistons are fitted to .002 in. clearance. Five operations are now performed on the cylinder bores and these are (1) rough bore, (2) semi-finish bore, (3) ream, (4) grind, (5) hone. Special new multiple spindle grinding and honing machines are used in the finishing of each block.

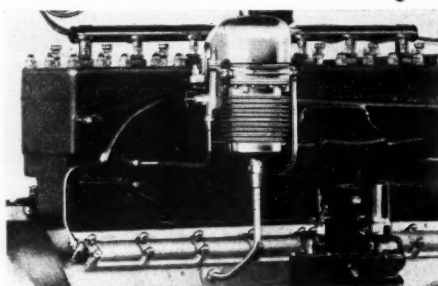
#### Oil Rectifier Installation

With the change in the piston design and the elimination of the extended lip on the piston skirt, the Skinner oil rectifying system now draws the oil through a by-pass valve in the oil gage line instead of from the pistons as on the earlier series. A "tee" joint connected with the rear camshaft bearing permits the oil pressure to go to the oil gage and to a balanced metering valve on side of the rectifier, the latter having direct connection with vacuum side of the rec-

Packard Eight 4-passenger Coupe listing at \$4,750

tifier. Other changes along this line embrace a combination oil filler and breather preventing the throwing of oil at high speeds and the flanging of the valve cover plate to allow a cork gasket to be used in preventing the escape of oil by the cover plate.

A new design of combustion chamber termed by the Packard Company as the



This view shows the new Skinner system. Oil is drawn past a metering valve shown on the left side of the rectifier. This valve is connected with a T-joint on the rear cam shaft bearing which also supplies oil for the gage. Otherwise the rectifier is the same.

"Turbo head" has allowed a higher compression and better turbulence with the resulting increase in brake h. p. In the new shape, the flat surface of the combustion head sets almost flush with the top of the block and extends approximately half way across the bore. The spark plug is located directly in the center of the domed portion and also comes in line with the centers of the valves with the points of the plug pro-

jecting well below the domed portion. The entire cylinder heads are machined all over with the combustion chamber polished also. New carburetors are provided to meet increased power of engines and both the intake and exhaust manifolding have undergone changes. Larger passages in the intake manifold have added greatly to the acceleration ability and the exhaust manifold is so constructed that the exhaust gases from the middle two cylinders pass through a chamber surrounding the intake manifold elbow and form a hot spot for heating the incoming mixture.

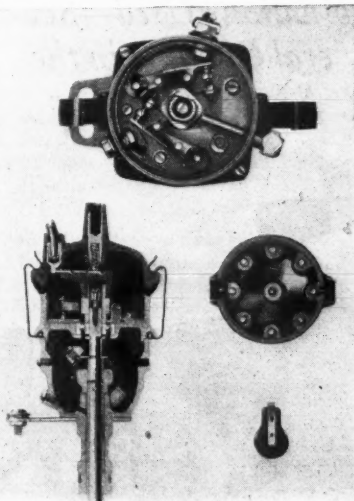
#### The Firing Order

In line with these changes, the firing order on the eight has been altered from 1-3-2-5-8-6-7-4 to 1-6-2-5-8-3-7-4 thus giving a complete change of direction flow resulting in reduced exhaust noise. Also, the depression in the manifold has been equalized by employing a tube that connects the front and rear intake galleries in the cylinder block. Other changes include increasing the diameter of the fan pulley and reducing by two the number of coils in the valve springs. The appearance of the eight engine has been improved considerably by the use of nickel plated acorn type cylinder head nuts, aluminum parts and sand blasted, cylinder block, rods and piping enameled, and large nickel plated nuts on spark plugs and new nickeled priming cups. Mufflers on both models have been enlarged to take care of the higher engine power.

Crankshafts on both engines have been made heavier, although their design is unchanged. The diameter of the main bearings has been increased by  $\frac{1}{4}$  in., the crankpin diameter is  $\frac{1}{8}$  in. greater and the width of the cheeks has been in-

creased by  $\frac{1}{8}$  in. The new shafts on six and eight now weigh 82 $\frac{3}{4}$  lb. and 97 $\frac{1}{2}$  lb., respectively. Newly developed machines are used to give a hone finish to the crankshafts. The Delco ignition distributor on both engines is of the single coil, jump-spark type employing a 4 lobed cam to insure positive firing in all cylinders at high speed. In the fuel system a gasoline filter is placed in the line between the vacuum tank and carburetor.

Two plate clutches with four friction surfaces are employed on both the six and eight cylinder chassis to replace the



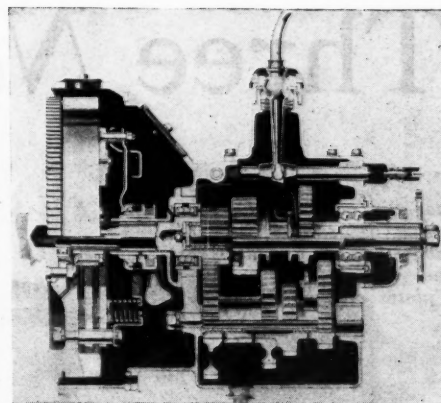
*This shows the new Delco distributor employed on the new Packards. A double lobed cam, operating two sets of contact breakers insures positive firing at high speed*

former multiple disk clutches which have been used for several years. Specially treated molded asbestos composition is riveted on either side of the two disks while the driving plate is unusually heavy and formed of cast iron. Due to the fewer rotating parts, it has been

possible to obtain better balancing of the clutch parts and the new design permits of smoother engagement and easier shifting. The clutch shifter thrust bearing has also been made heavier and otherwise improved. Only minor changes have been made in the transmissions and a backing light switch has been added to the gear shifter rail cover.

The first announcement is made at this time of the adoption of Packard-Bendix three shoe internal four wheel brakes, although the Packard cars appeared at the New York and Chicago national automobile shows so equipped. The general layout of the brake operating mechanism does not differ radically from the earlier method when a combination of exterior and interior brakes was used. A safety feature is incorporated in the front chassis springs on both cars. An auxiliary main leaf sets above the main leaf proper. The end of the auxiliary main leaf is curved upwards and into a hook over the eye formed in the true main leaf. In the event of failure of the front main leaf the weight is taken on the hook of the auxiliary leaf thereby retaining the front axle in place. On the Packard eight the rate of action of the front springs has been increased and three extra leaves have been added to prevent striking through and provide an additional factor of safety. Changes have been made also in the steering gear and the most important item is an improved method of locking the upper steering worm bushing in place.

On the tubular frame cross members the stock gage of the flanges has been increased from  $\frac{1}{4}$  in. to  $\frac{5}{8}$  in. In addition the six cylinder frame has been altered to accommodate Watson Stabilizers which are now standard equipment on this model. Stabilizers are continued on the eight chassis. An improvement has been made also in the spare wheel carrier to reduce the physical effort necessary to dismount and remount the spare wheel. Along with the full crowned one piece fenders which are



*This view shows the new two plate clutch which is employed on both six and eight cylinder models*

used on the eight chassis only, the running boards have been widened to give greater protection from wheel splashes.

Many improvements have been made in the interiors of the closed bodies. The front seat riser in the 5 pass. sedan has been removed thus lowering the seat and increasing headroom, and all folding seats in other models have been redesigned to provide increased comfort. Doors are trimmed without pockets, small compartments being provided behind the front seat on the sedans. Rapid action window regulators in improved runways make for easier operation of the windows, and a concealed method of attaching the door sill plates is adopted. In place of foot rails, hassocks upholstered to match the interior are used on the sedans. On the eight bodies, all exposed interior hardware is finished in Old English bronze and all cowl and window mouldings are of walnut.

Vanity and smoking cases finished in tooled leather resembling walnut are fitted in all sedans while a special clock is offered on the eight cars. Otherwise the equipment on the Packard cars is the same as before.

## 91 $\frac{1}{2}$ Cubic Inch Rule Puts Heavy Strain on Race Engine

The new 91 $\frac{1}{2}$  cubic-inch racing cars, given their premiere at Indianapolis, Memorial Day, place the severest test on the parts of a gasoline engine that they have ever been called on to withstand. They impose even more terrific strains on an engine than does the highest powered or speediest airplane, shooting through space at 300 miles an hour.

That is the opinion of Harry Miller, noted authority on racing cars, designer and builder of the Miller specials.

The tiny new 91 $\frac{1}{2}$  inch Millers will soon be fully as fast, and perhaps faster, than any car of larger size that has preceded them, in conquering speeds up to 140 miles an hour, it is indicated. Both Bennett Hill and Harry Hartz recently secured 130.8 miles an hour in trials with their cars on the racing oval at Culver City, Cal.

Some idea of the terrific strains that the spark plugs, pistons, connecting rods and bearings, for example, are called on

to withstand, is indicated by these facts:

The new engines turn up 7000 revolutions per minute at wide open throttle.

At that number of revolutions their actual horse power is ten times their rated horse power. In other words they actually develop 154 horse power against their rated figure of 15.3.

Their superchargers actually revolve at 37,000 revolutions a minute at wide open throttle. The tip of the supercharger impeller travels at a speed of 720 miles an hour, or 12 miles per minute.

## Photographs Make Good Used Car Ad Copy

The plan of printing photographs, descriptions and price quotations of each used car advertised was tried by the Pryor Motor Co. of Birmingham, Ala., as the next thing to having a personal showing, proved to be an excellent method. One of the most difficult things to handle in the sales of used cars, according to Andy Pryor, president of the

Pryor Motor Company, is that of advertising that will cause the prospective buyer to come into the store and ask for a certain car or type of car.

This method of advertising not only gave the customer a clear idea of just what the dealer had at the time but it saved time all around. Only those customers who were interested in a certain car came to look. They saw the one they were interested in and either bought or went away. Of course it is good business to have people come into the shop even when they are not thinking of buying, but the point is in this advertisement that it brought in the real prospects and sold the cars.

Most of them came in and made an inquiry on the order of this:

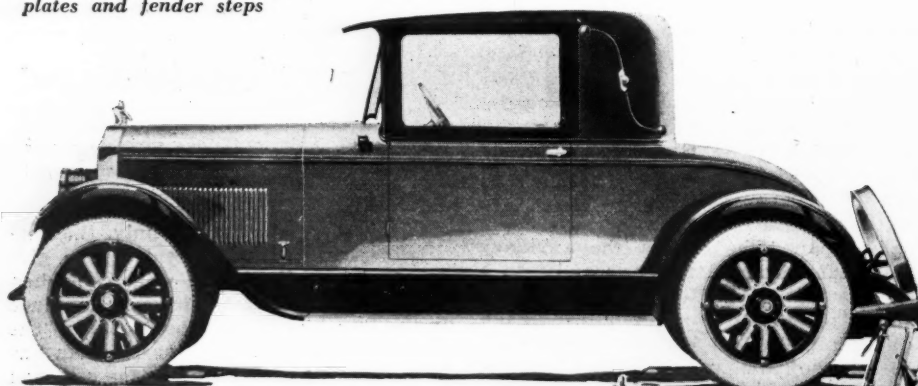
"I want to see that Hudson Super-Six sedan priced at \$795 if you still have it," or "How about that Ford Touring car at \$165?"

These queries gave the dealer an idea of just the sort of used car the customer was interested in and they got down to business without any false starts.

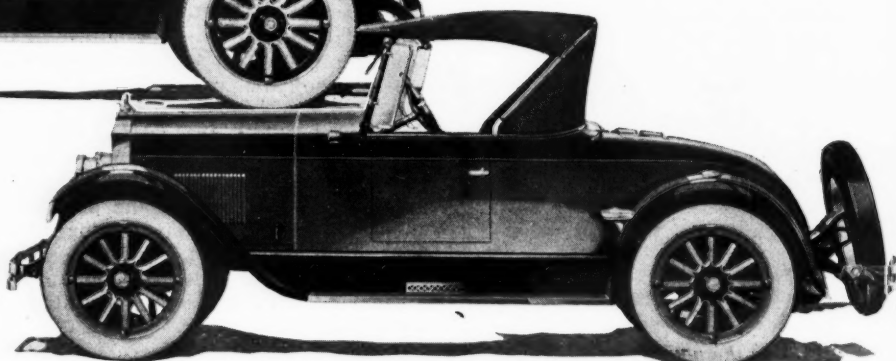


# Three New Body Styles in Star's Improved

*Star Six coupe. The sport coupe is similar to this model but has a rumble seat and nickeled lamps, scuff plates and fender steps*



*Polished Lacquer Finish  
in New Color Com-  
binations Used—Sev-  
eral Changes in the  
Six Cylinder  
Engine*



*Usually complete accessory equipment is furnished on this Star Six deluxe sport roadster. Although the illustration does not show them, there are handles to assist in lowering the top at its rear upper corners*

**D**DOUBLE belt mouldings, new colors in polished lacquer instead of the satin finish hitherto employed and numerous other refinements in body design and appointments resulting in more attractive appearance and greater comfort, feature the new line of Star four and six-cylinder cars being introduced by Durant Motors, Inc. Three new body models have been added to the line consisting of a convertible roadster on the four-cylinder chassis listing at \$550, and a sport coupe and a five-passenger sedan on the six listing respectively at \$995 and \$975.

Except in the case of the four-cylinder touring model which now lists at \$550, an increase of \$10, there have been no price revisions.

A six-cylinder, one-ton capacity truck called the "Compound Fleetruck" and priced at \$975 for the chassis, also has been added to the line. The feature of this new job is an entirely new design of four-speed transmission incorporating internal gearing.

There have been no mechanical changes in the four-cylinder chassis, but a number of improvements have been made in the power plant of the six. The oil pump has been enlarged and the main bearings are now of the bronze-back, babbit lined interchangeable type to facilitate service. In addition, the cast iron pistons formerly employed have been replaced by Bohnalite aluminum alloy pistons of the Nelson type incorporating a steel strut construction. Incidentally pistons of this type have been used in the Star four engine for some time past.

On both open and closed models, the tops are carried forward of the windshields to provide a sun visor and at the same time this feature combined with the double belt mouldings, adds materially to the visual length of the

cars. The four-cylinder models are all finished in Persian blue with black moldings and gold striping. On the closed models on this chassis, the body color is carried to the top of the door frames instead of stopping at the belt line.

In the six-cylinder line, the deluxe sport roadster is in artillery gray below and beige brown above the belt line; the sport coupe in Persian blue below and dark blue above; and the landau sedan in powder blue and black. The remaining six models are finished in bronze green with black moldings and gold striping.

Nickled radiator shells are standard on both lines and all closed models have one-piece ventilating windshields, visors, ventilators, windshield wipers and rear vision mirrors, the last two items also being furnished on the six-cylinder deluxe sport roadster. This special roadster carries an unusually wide range of equipment including windshield wings, nickeled head and cowl lamps, ornamental motometer, aluminum spider steering wheel, kick plates, aluminum deck cover bars, detachable top brackets, aluminum fender steps to rumble seat, front shock absorbers, nickeled front bumpers and rear bumperettes. The top is khaki and the upholstery leather, other open models being done in artificial leather. The upholstery in the closed

models is velour in colors to match the external finish.

Balloon tires are regular equipment on all models except the four-cylinder open jobs which have high pressure cords. On the six-cylinder closed models, motometers with ornamental caps are regular equipment.

The new Star Four convertible roadster gets its name from the fact that it may readily be converted into a light delivery car by removing the large hinged rear deck cover and substituting a commercial box. The spare tire on this model is carried on the left running board just aft of the front fender.

Although the "Six" sport coupe is similar in appearance to the standard coupe, it has a rumble seat upholstered in leather in the rear deck. It also has the following additional equipment: nickeled head and cowl lamps, fender steps to rear deck, kick plates and hand rail. The new six sedan is a four-door model carrying the same equipment as the landau sedan except that it has no vanity case or ash receiver.

No details of the four-speed transmission used in the "Fleetruck" are available at present, but its advantages are that it makes available a wider range of speeds and also gives greater fuel economy. Power is available for heavy pulling at low speeds and yet by use of the fourth gear, high speeds may be



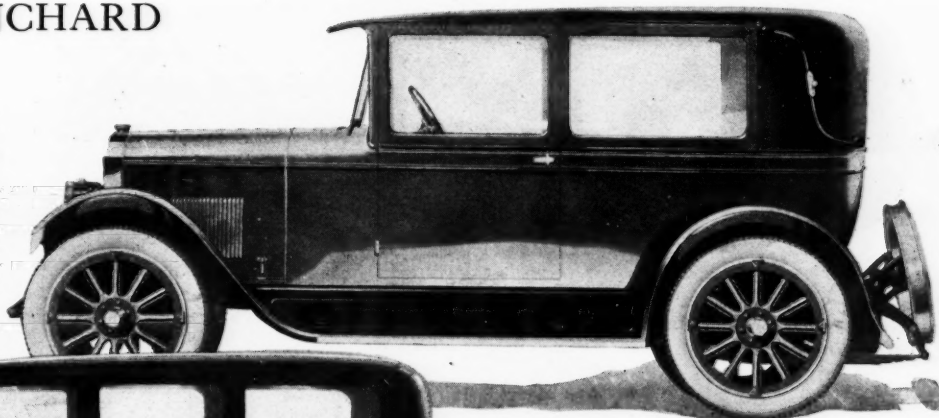
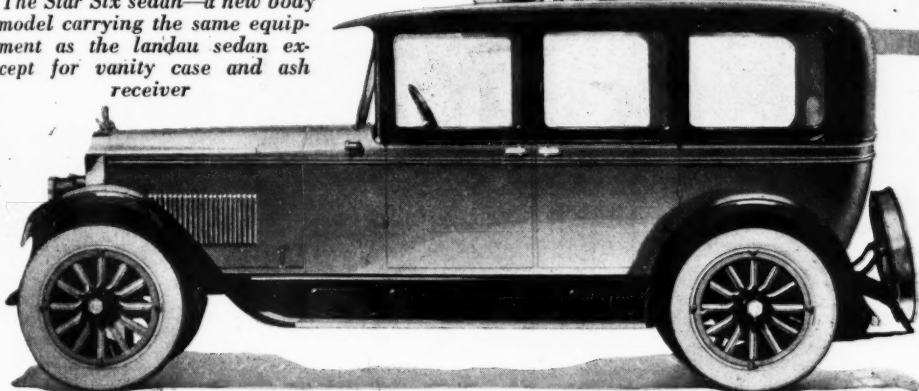
# Line of Fours and Sixes

By DONALD BLANCHARD

obtained at lower engine speeds. Careful tests are said to show that use of the fourth gear results in a saving of more than 20 per cent in fuel. The new transmission has a standard shift, fourth speed being obtained by pressing down on the shifter lever.

The "Fleettruck" chassis, which is pow-

*The Star Six sedan—a new body model carrying the same equipment as the landau sedan except for vanity case and ash receiver*



*The improved Star Four coach showing the belt moldings and the sun visor*

gency brakes act externally and internally, respectively, on 14½ in. diameter drums on the rear wheels, the width in each case being 2½ in. The chassis weight is 2350 lb. with a body allowance of 950 lbs.

The various models included in the new Star line, together with their prices follow:

Four-cylinder — convertible roadster, \$550; touring, \$550; coupe, \$675; coach, \$695; sedan, \$795.

Six-cylinder — touring, \$725; coupe, \$820; sport coupe, \$995; coach, \$880; sedan, \$975; landau sedan, \$995; deluxe sport roadster, \$910; Fleettruck, \$975.

ered with the same engine used in the Star Six passenger car, will take any standard one-ton truck body. Fuel is carried in an 11-gal. tank under the driver's seat and is fed to the Tillotson carburetor by means of a vacuum system. The truck is mounted on 30x5 in. high pressure cords and its wheelbase

is 128 in. Semi-elliptic springs are used front and rear, the former being 36¾ in. long by 1¾ in. wide with seven leaves and the latter 45 in. long by 2½ in. wide with twelve leaves.

The rear axle is a semi-floating, banjo type with spiral bevel gears providing a reduction of 5.1 to 1. Service and emer-

## Clean Spark Plugs in Quantities By New Method

A new method for cleaning and testing the spark plug and cleaning the shells of the most efficient yet discovered has been evolved by the United States Air Service at McCook Field. The method, although designed for spark plugs used in aircraft engines in which frequent cleaning or replacement of plugs is required, is applicable also to the automotive field, and is especially useful to companies operating fleets of passenger cars, taxicabs, buses or trucks.

The method consists of disassembling the spark plug and cleaning the shell of carbon by means of a salt bath. This bath consists of equal parts of commercial sodium nitrate and potassium nitrate. The salt mixture is placed in a cast iron vessel and heated by means

of a suitable torch. The mixture melts at a temperature of 460 degrees Fahrenheit and should be heated until the solution becomes clear. The spark plug shells are inserted in this solution by placing them in ordinary tin cans with ¼ in. holes punched through the sides and the bottom and lowering them into the salt bath. The salt has the effect of burning off all the carbon.

After the carbon is burned off, i. e., when bubbling ceases, the cans containing the shells should be removed and washed in pails of hot water to remove all traces of salt. After this it is advisable to dip them in a pail of kerosene containing about 5 per cent lubricating oil in order to coat the shells and prevent them from rusting.

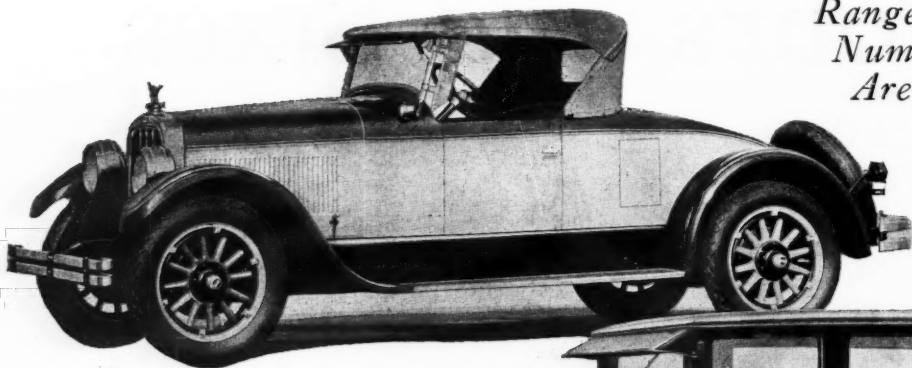
The spark plug cores are best cleaned by placing them in a jig and cleaning the insulation and terminal with fine sand

paper. Carborundum or emery cloth should not be used, as these materials are conductors and may short the plug. Sand paper should not be used on porcelain cores as the glaze will otherwise be removed. Such core should be put in a mixture of gasoline, benzine and alcohol to soften the carbon, when it can be blown off with an air hose or rubbed off with a rag.

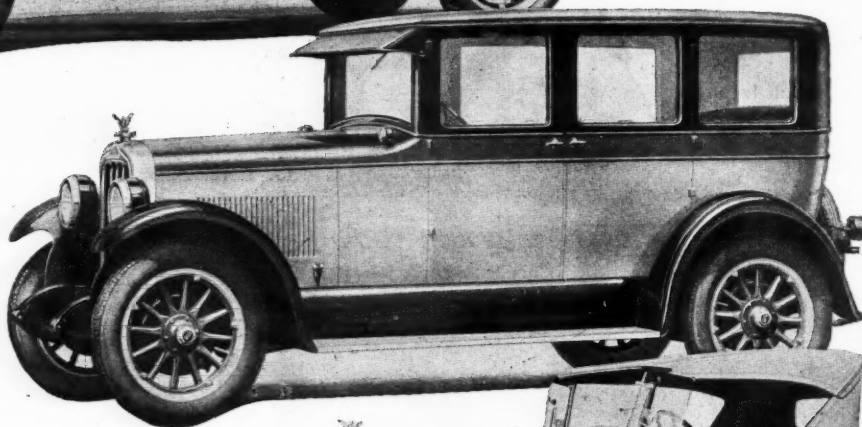
Cores of porcelain plugs which have been overheated will show small beads on the surface where the glaze has melted. Cores showing such beads should be discarded as should all plugs with hair-line cracks. Additional information regarding this method of cleaning spark plugs together with instructions for testing cleaned plugs can be obtained from McCook Field Report, Serial No. 2607, published by the Government Printing Office in Washington.

# Chandler Line Now Includes

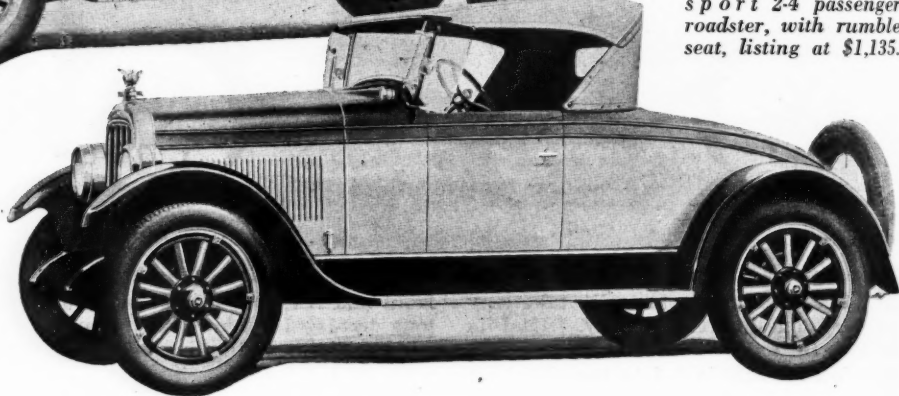
*Nineteen Body Styles with a Price Range from \$945 to \$1795 and a Number of Mechanical Changes Are Provided in 1927 Offering*



(Top) Big Six 24 passenger roadster with rumble seat, listing at \$1,695.



(Center) Special Six 5-passenger sedan, listing at \$1,295.



(Bottom) Standard Six sport 24 passenger roadster, with rumble seat, listing at \$1,135.

WITH reduced prices, a number of mechanical improvements, and nineteen different body models on three chassis, the Chandler Motor Car Co., presents its 1927 offering.

The Pike's Peak engine and "One Shot" chassis lubricating system are continued in the Big Six chassis for 1927, while smaller replicas of the Pike's Peak engine are used in the Special Six and Standard Six chassis which have wheel-bases of 116 in. and 109 in., respectively. The "One Shot" lubricating system which makes it possible to lubricate all chassis parts by the operation of a small plunger within reach of the driver is also standard equipment on the Special Six and Standard Six. Mechanical four wheel brakes of the external contracting type are used on all models. The chassis of the Big Six has been stiffened by the use of a new tubular cross member.

In the design of the Pike's Peak engine a number of changes have been made which include larger bearings and a heavier crankshaft, to reduce vibration to a minimum. Smoothness of operation is also obtained with the use of a new front flywheel, to balance the rear flywheel. In connection with the use of larger crankshaft and bearings an improved high pressure lubrication system has been used for both crankshaft and camshaft bearings, as well as connecting rods and piston pins. A larger fan has been introduced on the 1927 Chandler in order to more effectually cool the engine, while the addition of a Motorstat insures the engine quickly attaining the most efficient operating temperature. The Motorstat is also included on the other models.

New equipment designed to increase the life of the engine on all models includes an air cleaner and an oil filter.

A new type of cylinder head containing unique changes in combustion chamber design is said to reduce to a marked degree the formation of carbon and also tends to reduce carbon knock or detonation.

A new chassis feature on all models is a patented self-oiling shackle silencer, which regulates the tension on the shackles and at the same time exerts a gentle action in controlling the rebound of the spring when traveling over rough road. A new type steering gear which gives easy operation with four wheel brakes and balloon tires is standard on the 1927 Chandler.

Improved carburetion is obtained with the use of a new manifold which is said to give perfect distribution of fuel to all six cylinders at all speeds, eliminating the tendency of raw fuel to flow into any one or two cylinders in excessive amounts. The exhaust manifold is larger than was previously used and contains a center hot spot chamber with three distinct passages from two cylinders each.

This feature does away with back pressure reaction of any one exhaust on the other and contributes to smooth even flow of power.

Draining of the crankcase has been simplified by incorporating a drain cock on the left side of the engine. When draining out the old engine oil it is only necessary to lift the hood and turn the wing nut which is in the rear of the carburetor.

All closed bodies

have been materially lowered and the appearance has been modified to give a stream line effect. All models carry the characteristic tripaneled full nicked radiator design, to which has been added a radiator bar cap on which is mounted an American Eagle. All closed models on all three chassis have the full version windshield, which is readily adjustable to suit the driver's convenience. Closed bodies also have very narrow corner posts to give maximum range of vision.

On the Big Six models a new instrument board is used on which there is a slightly raised panel. The entire board is illuminated by an adjustable light to accord with the driver's preference for illumination. New interior hardware fittings are also used.

## Big Six Body Models

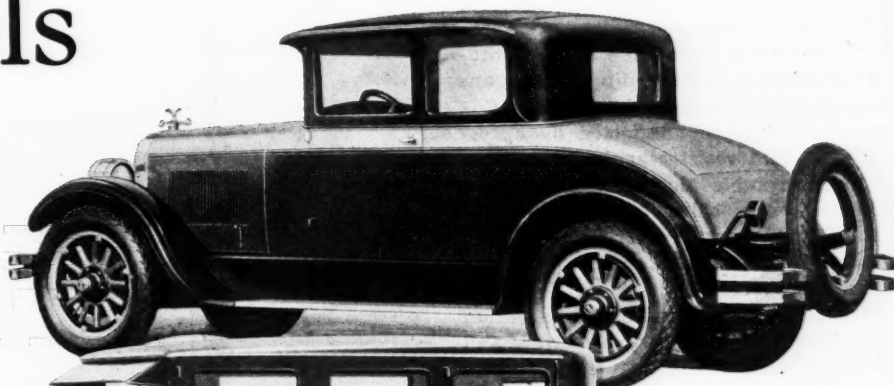
The new Metropolitan Sedan on the Big Six chassis, listing at \$1595, is one of the outstanding cars of this series. It is finished in lotus blue, while the upper structure is black. The wheels are also finished in lotus blue and are striped with bronze. The window ledges are also



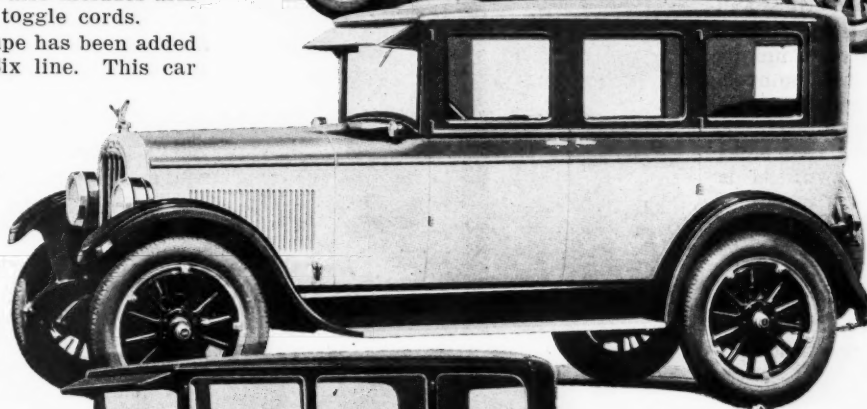
# Standard, Special and Big Six Models

edged with lotus blue. There is also an optional color choice in two tone silver gray and Sheridan gray lacquer with the upper structure finished in black. With this finish the window ledges are also edged with Sheridan gray. Blue-gray mohair is used for the upholstery. Window panels are finished in inlaid walnut. The interior equipment also includes arm rest, smoking set and toggle cords.

A four passenger coupe has been added to the Chandler Big Six line. This car is finished in two-tone Sheridan gray somewhat similar to the Metropolitan sedan. Black bead molding with special



(Top) Big Six 4 passenger coupe listing at \$1,675.



(Center) Standard Six 5-passenger sedan listing at \$995.

(Bottom) Big Six Metropolitan Sedan.



rade roadster is of somewhat lower body lines and is finished in two tone olive green and pearl gray finish with special striping. The wheels are natural wood finish. Optional color choice is navy gray and dark blue lacquer. The Comrade roadster is upholstered in hand buffed Spanish leather. This car has a roomy rumble seat for two extra passengers, also a compartment for golf sticks.

## Bodies on Special Six Chassis

There are five body models on the Special Six chassis which is powered with the smaller six cylinder Pike's Peak engine having bore of 3½ in. and stroke of 4¼ in. These prices range from \$1145 for the five passenger touring to \$1295 for the five passenger sedan. One of the most attractive cars of the line is the 1927 Special Six sedan finished in two

(Continued on page 34)

striping is used. The wheels are finished in gray with gold stripes. Interior finish and upholstery is similar to that used on the Metropolitan sedan. A new type walnut finish instrument board is used which in addition to the usual instruments, contains a constant reading gas gage and a Radiometer which shows the temperature of the cooling system. The Big Six series also includes the five passenger Twentieth Century sedan, fin-

ished in two tone brown lacquer or two tone gray, the upholstery being gray broadcloth. There is also a Big Six seven passenger sedan finished in dark blue lacquer or brown lacquer and upholstered in mohair. The two touring cars of five and seven passenger capacity are offered with color options of two tone gray green or Luxor blue. On the touring cars the upholstery is hand buffed leather. The 1927 Big Six Com-

## Chandler Cars for 1927

Following are the models and prices in the new Chandler line:

### BIG SIX SERIES

Sport Touring, 5-Passenger .....	\$1545
Touring, 7-Passenger .....	1645
Roadster, 2-4 Passenger (Rumble Seat).....	1695
Sedan, 7-Passenger .....	1795
20th Century Sedan, 5-Passenger .....	1495
Metropolitan Sedan, 5-Passenger.....	1595
Coupe, 4-Passenger .....	1675

### SPECIAL SIX SERIES

Touring, 5-Passenger .....	\$1145
Sport Touring, 5-Passenger .....	1295

Coupe, 2-Passenger .....	1195
DeLuxe Coupe, 2-Passenger .....	1285
Sedan, 5-Passenger .....	1295

### STANDARD SIX SERIES

Touring, 5-Passenger .....	\$ 945
DeLuxe Touring, 5-Passenger .....	1005
Coupe, 2-Passenger .....	1035
DeLuxe Coupe, 2-Passenger .....	1125
Sedan, 5-Passenger .....	995
DeLuxe Sedan, 5-Passenger .....	1095
Sport Roadster, 2-4 Passenger (Rumble Seat)....	1135

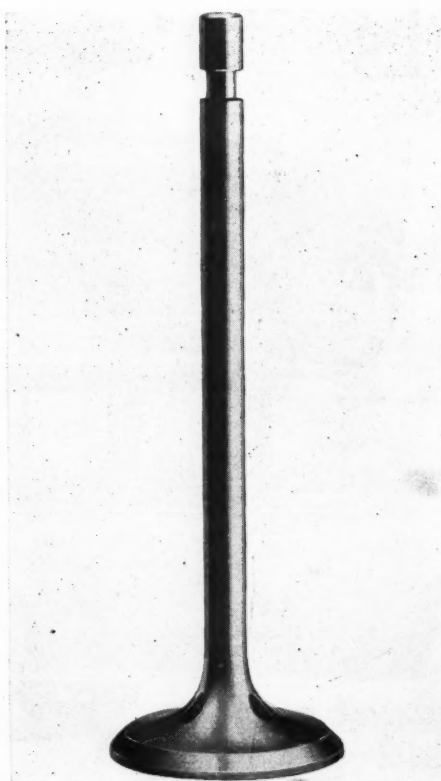


# New James Valve

EMBODYING a new principle of construction and formed of a special alloy metal new to the automotive industry, "self-cooling" valves announced by the James Motor Valve Co., Detroit, Mich., are unaffected by excessive heat, and resist warping or pitting to a remarkable degree. These new valves are now being produced for the replacement market after having been adopted by certain passenger car and engine manufacturers.

In seeking longer valve life, attention was directed to securing better and quicker dissipation of heat at the valve head. In the new James valves a unique hollow-head construction is employed. Instead of the customary type of solid construction, a hollow chamber cast inside the valve head with three vent holes opening into the radius below head is adopted. As will be seen from the illustration these three vent holes permit circulation of air through the interior of the valve head.

When the engine is running and the exhaust valves open, the rush of the gasses by the valve tend to create a suction below the head and this action draws the excessive heat in the hollow chamber away from the head thereby cooling the valve head. Even though the gasses are of an unusually high temperature, the fact that they are forced to circulate through the head causes a cooling action. While this design allows of maximum strength, the hollow construction of the head reduces the mass of metal found in the usual type of head and this factor alone reduces considerably the expansion of the valve stem. Using the James "self-cooling" valves, it is possible to set the clearance between tappets and valve stem closer than usual due to the lesser expansion of the stem.



*The James Valve showing vent holes under the head*

It is recommended that the "self-cooling" type of valve be employed for both inlet and exhaust valves.

The metal employed in the construction of the new valves is known as Nichro-loy and is used exclusively by the James Co. in the fabrication of the "self-cooling" valves. Basically, the metal consists of nickel, chromium and carbon, melted in an electric furnace and



*Cross section showing unique hollow head construction of the new James Valve*

poured at a temperature of 3,800 deg. Far. In the casting operation, the chaplet holding the core in place for the hollow chamber is absorbed by the head and becomes integral with it as the metal is poured into the mould. Core sand is removed from the interior chamber after the casting operation by sand blasting.

Test cars with the new valves have run 62,000 miles without having the valves reground. During the last five years tests have been made in which over 2,000 different cars have been employed. In order to witness performance in the laboratory under actual conditions with heat temperatures ranging above 3,000 deg. Far. special machinery available only in France was used.

The principal market for the new valves will be in the truck, bus, airplane, motor boat and high powered passenger car fields. With the valves employed in the smaller passenger car engines and the like, the type of valve head is slightly changed to the dome type to allow of a large enough interior chamber under the head. Prices of these valves will be slightly higher than the regular style valves which will also continue to be marked by James Co.



*Photograph of the five passenger phaeton in the new Moon Six-Sixty line which was described fully in last week's issue of MOTOR AGE. This new line of European-American design is made in three body styles, roadster, coach and phaeton, all priced at \$995 at the factory. The car is equipped with a six-cylinder Continental engine and has 110 in. wheelbase*

## Give Repossession Data

NEW YORK, Aug. 7.—Taking issue with the statements that "no-recourse" financing increased repossessions and imposed a burden on the used car market, Hare & Chase, Inc., declares that with its annual volume of business of \$50,000,000 repossessed cars on hand as of July 24 totaled 587, an average of eight for each of the 73 branch offices and of one for every seven dealers of the 4,000 served by the company. The largest single accumulation was 52 in New York City.

## To Handle Oldsmobile

SPOKANE, Wash., Aug. 7.—The Hotchkiss Motor Company, 712 Second Avenue, Roy Hotchkiss, president and manager, has taken over the Oldsmobile line in place of the Hudson-Essex dealership it formerly had. The firm will be city dealer under Johnson Motor Company, distributors.



## Attractive Buildings Bring More Business

THIS BEAUTIFUL FILLING STATION OFFICE is the most snappy looking place in town, excepting nothing. The photo does not do it justice for the blue blinds, the harmoniously tinted stucco with colored tile inserts and relief decorations and numerous other artistic and attractive details are lost. The interior appointments are in keeping with the exterior and the service is perfect.



AN EXHIBITION OF BODY STYLES in the greatest range of styles and color combinations ever assembled by one manufacturer has been staged by the Cadillac Motor Car Company's plant in Detroit for review by Cadillac distributors and dealers, and afterward thrown open to the public. The new program includes 50 body types which may be had in 500 color and upholstery combinations ranging in price from \$2995 to \$9300.



CHARLES PENFIELD—hatless—Sales manager for the Pacific Nash Motor Co., San Francisco, is proving the strength of the Nash closed car body with thirteen of his heavy weight Sales Jammers. Guess Charlie isn't superstitious.



5 NEW STUDEBAKERS purchased by the Massachusetts State Police for patrol duty. Pretty soft for the cops.

August 12, 1926



# SELL THESE NEW ACCESSORIES

## Cooper Heater for Ford

A HEATER that fits all models of Ford cars, is easy to install and provides an abundance of clean and safe heat is being manufactured by the Cooper Manufacturing Co., Marshalltown, Iowa.

This heater is installed around the hottest part of the exhaust pipe and is adjusted to position by tightening seven small bolts and nuts. The only alteration required is a small square hole in the floor board to admit the hot air register. Installation should be made in less than a half hour, according to the manufacturer.

Special emphasis is placed on the fact that this heater fits all models of Ford cars whether equipped with regular manifold or some special system or hot spot. The heater is constructed of heavy sheet metal. A patented deflector directs a large volume of cold air into the heater and as it becomes warm it passes through the adjustable register into the car. There is no possibility of exhaust fumes becoming mixed with the heated air.

The list price of the Cooper heater is \$2.50.

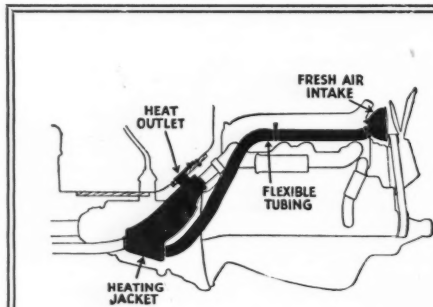
## New Perfection Heater

PERFECTION Heater & Mfg. Co., Cleveland, O., offers the public a new type Perfection Heater which is promised by the manufacturers to provide quick, pure warmth at a relatively low price. The new Perfection heaters retail at \$5 and \$8 and are made in models to fit more than 90 per cent of the current passenger cars.

The illustration shows a typical installation on a Dodge Brothers car.

Immediately back of the fan is a funnel intake through which fresh air is forced. This air travels down through the flexible tubing and into the heater jacket on the exhaust pipe immediately back of the manifold. The heated air then passes into the heat outlet, or register, in the toe-board of the car.

Rapid circulation of heat through the car is insured by the force of air driven in by the fan. Regulation is accomplished by adjusting a sliding plate in the register which can be moved with the foot.



New Perfection heater

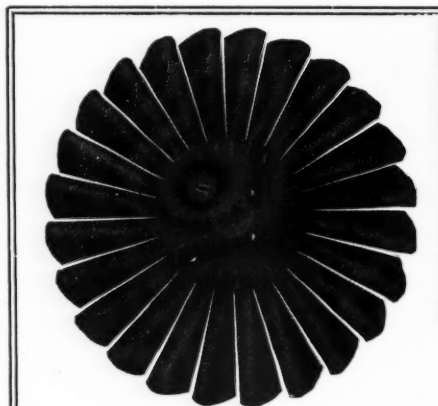
## G. B. Impeller

IN the G. B. Impeller the makers declare there is a facility which gives remarkable results in cooling the Ford engine. The ordinary Ford fan has but four blades while the G. B. Impeller has 24 blades and in this difference is said to lie a great difference in cooling efficiency. It is noted by the manufacturers in presenting this product to the public that a fan cooling an automobile radiator must overcome the resistance encountered by the air when flowing through the radiator and must be able to expel the air from under the hood. To accomplish this the fan must develop efficiently the necessary static pressure to overcome resistances. This is what the G. B. Impeller is declared to accomplish, sustaining an expansion of air that keeps it moving through the different outlets.

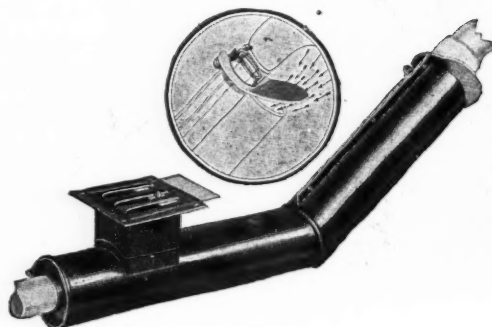
The G. B. Impeller is made by DeBothezat Impeller Co., 1922 Park Ave., New York.

## Obtain "Triplex" License

LICENSE for manufacture of "Triplex" "non-shatterable safety glass" in this country has been obtained by the Triplex Safety Glass Company of North America, Hoboken Terminal, Hoboken, N. J. "Triplex" is composed of two layers of plate glass enclosing one layer of pyralin, welded together by heat pressure. Armory L. Haskell, until recently vice-president and general manager of the General Motors Export Corp., is president of the Triplex Safety Glass Co. of North America.



G. B. impeller



Cooper heater for Ford

## Reflex Safety Auto Light

IN the Reflex Safety Auto Light the maker claims a non-glaring automobile headlamp which has been perfected without the use of colored glass or lens. The manufacturer is the Reflex Auto-Light Corporation, Indianapolis, Ind. The headlight is declared to furnish reflex light rays which are absolutely controlled and which give perfect illumination 500 feet ahead of the car with no glare to the approaching motorist. In addition to illuminating the road straight ahead the Reflex Safety Auto Light will furnish illumination on the right side of the road for 20 feet, thus being a protection against driving into a ditch or some obstruction. The light is only 4 inches in diameter and ornamental. The finish is black duco and nickel. Two are used. Each is placed on the front fender skirt below the regular headlight at a 30 degree angle, an adjustable bracket being used.

## Larkin-Thuro Lubricant

LARKIN Automotive Parts Company, Dayton, Ohio, is introducing a new lubricant known as Larkin-Thuro Lubricant. The makers describe this product as "not a grease but a pure solidified oil which possesses the quality of wetting or soaking the bearing so as to leave an oil film over every part regardless of the pressure to which the bearing is subjected." Special care is taken in the refining to develop the greatest possible degree of lubricating value, the producers say. Larkin-Thuro Lubricant is designed for use on any car equipped with a high pressure lubricating system.

## Wright Ford Brake Adapter

A DEVICE which makes possible the adaption of the 1926 Ford brakes on previous models of the car is being produced by the Wright Co., 845 State St., Springfield, Mass. The adapter lists at \$11 and the necessary Ford parts list at \$4.80 and the installation, it is claimed can be completed in 1½ hours.



Reflex safety auto light



# The READERS' CLEARING HOUSE

Questions And  
Answers



On Dealers  
Problems

## Some Information About the Chrysler

Q.—How fast can the Chrysler Model 70 stock car go and is it true that it can go 47 miles per hour in second gear? What is the power curve on this engine? I understand that this engine can turn 3600 r.p.m. and the local man tells me that they do not have to change the oil only every 2500 miles on account of the oil filter on this car. I cannot understand this even if the oil is filtered it would seem as if there would not be any lubricating properties left after being churned for even half that distance. He also tells me they only have to clean carbon every 25,000 miles on account of their air cleaner. It did not sound hardly reasonable and as I am not interested in any particular car and am running a general repair shop I felt that I wanted to know the facts in this case.

The authentic information which we have available on the Chrysler car was published in the December 27, 1923, issue of MOTOR AGE and in case you have mislaid this copy of the paper we are mailing you the issue in question so that you will have this information. As noted in this article the roadster is guaranteed to attain a speed of 75 miles per hour, so that it would seem likely that the car would do 47 miles per hour in second gear, although we have no definite data on this point. Changing the oil is not necessitated by the churning action of the crank, but by dilution and by impurities getting in the oil. The lubricating properties of the oil are also affected somewhat by heat. The filter will of course, operate to eliminate to a great extent particles of metal from getting in the oil and with efficient carburetion the amount of dilution will be reduced to a minimum, so that in a well designed engine the figures given are well within reason. The operation of the air cleaner in reducing the necessity for cleaning carbon, is due to the fact that the deposit in an engine is not all carbon, but consists to a great extent of dust drawn in through the intake manifold. For this reason if the dust can be eliminated to a great extent it will also reduce the amount of deposit in the combustion chamber, although we would hesitate to say the exact mileage at which cleaning would be required.

Q.—What is the power curve on the Studebaker special six and big six? How many revolutions per minute will they turn over? I have just completely overhauled one of these engines and have installed a big six cylinder block on a special six chassis, using the special six gear ratio. What speed should this car be able to reach when equipped with Lynite pistons.—Benson's Repair Shop, 515 Johnson street, Keokuk, Iowa.

Information of this character is considered confidential by a number of the

firms making automobiles and in this particular case most of the information you request is not available. The approximate maximum horse power developed by the light six, big six and special six is 40 horse power, 60 horse power and 50 horse power respectively. As to the exact effect of the combination you mentioned, however, we would hesitate to pass an opinion.

## WHITE AXLE JOB MADE EASY

Q.—I notice in your June 10, 1926, issue of MOTOR AGE on page 27 an article entitled an "Axle Job for a Real Mechanic." This article tells about overhauling the axle of a White two ton truck. The description is all O. K. but we have a way of saving a lot of hard work. We take the wheels and shaft out of the way, loosen nuts on spring hanger shafts on one side so that the axle housing can be pulled out about  $\frac{3}{4}$  in. Take bolts out of differential housing and spread axle housing enough to let the differential come out. In that way we do not have to disconnect the axle housing from the springs and also radius rods.—J. L. Robertson, Whittier Shop, Motor Transit Co., Whittier, Calif.

## Wheel Alignment with Balloon Tires

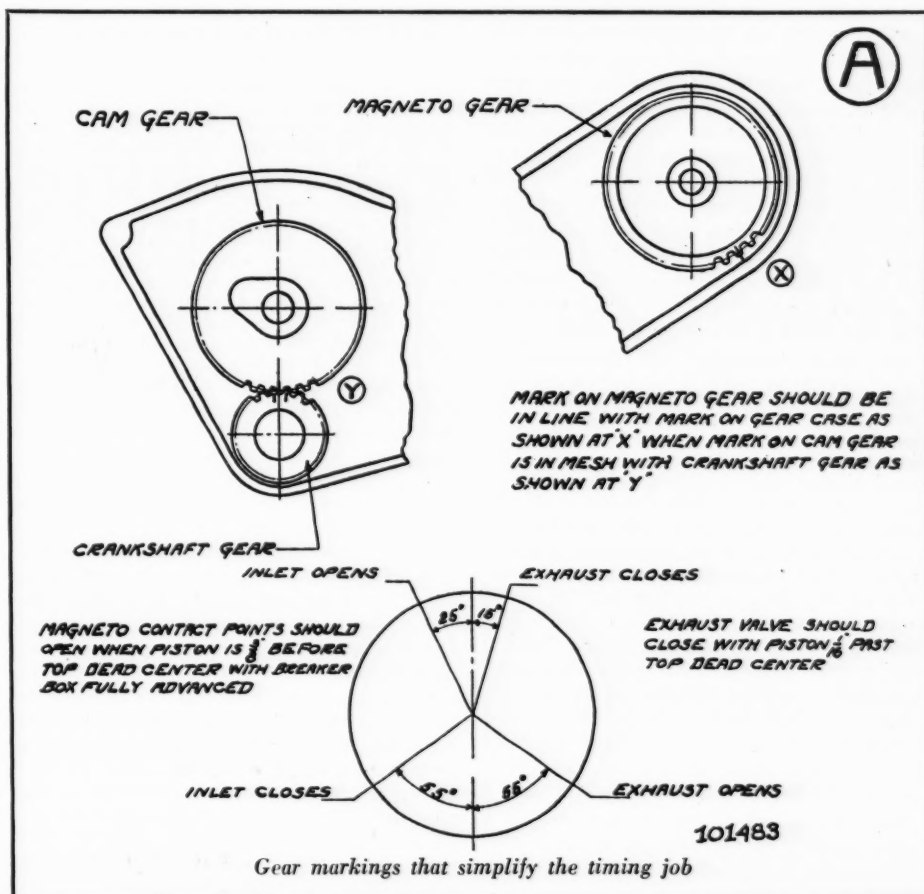
Q.—On a special Studebaker Six we have installed balloon tires and want to know how to align them, whether straight or with a small toe-in. Here in town there seems to be a difference of opinion.—W. S. Lyons, 204 N. Goodrich St., Newcomerstown, Ohio.

It is generally understood that balloon tires do not require the same amount of toe-in as cord tires. The toe-in should be anywhere from  $\frac{1}{8}$  in. to zero. One recommendation often made is to have no toe-in when pressure at the forward portion of the wheel is exerted so as to take all the slack out of the steering connection and make the wheels toe-out as much as possible. Under these circumstances zero toe-in is considered correct.

## EXCELSIOR VALVE TIMING

Q.—Supply sketch showing timing gear setting of an Excelsior motor cycle and tell me which is the No. 1 cylinder.—Edward Fedash, Kangley, Ill.

We are publishing an illustration which gives instructions for timing the Excelsior motorcycle engine. When sitting on the machine the No. 1 cylinder is the rear one.



# Planning Your New Building

By Tom Wilder

## A Lot with Extensive Frontage Is Ideal

Q.—I am planning to build a new showroom and service station (Buick only) on a lot that is 88 ft. front by only 50 ft. deep. Due to the unusual shape of my lot I am rather at a loss as to the best method of arranging my building. I fancy that I shall need not less than 30 by 30 ft. for display room. Parts room should be large enough to take care of \$5,000 parts stock, and I carry about \$2,000 or slightly less of accessories. Probably would be well to have parts and accessory room immediately behind the show room in order that an accessory display could be made that would be seen from the showroom floor.

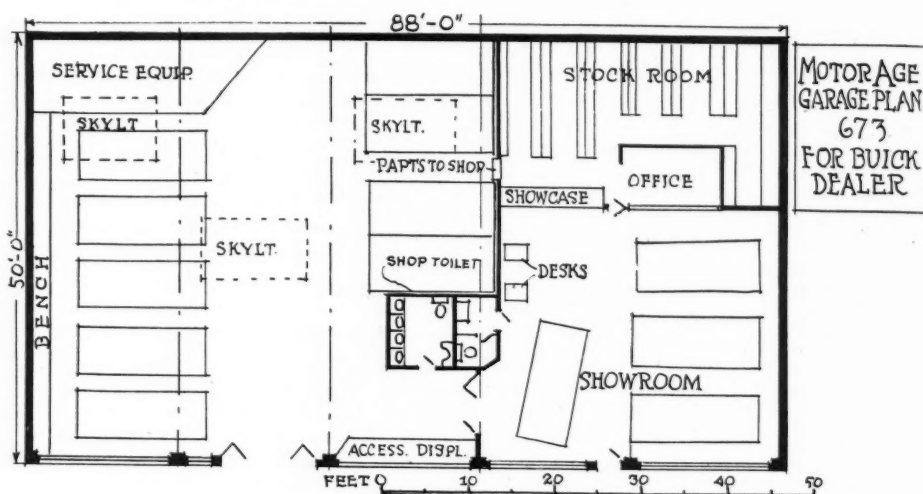
If possible I would like to have ladies rest room with toilet, and toilet for mechanics. They could be adjoining and cut expense and yet have one open from showroom floor and other from shop. Also should have wash room for mechanics. In considering this matter I wish you would keep in mind the fact that you cannot possibly have too much light in a garage.—Buick Dealer.

Your odd shaped lot is a decided advantage in that it has so much frontage. Think how much harder this would be to arrange in a good manner if this were turned the other way. It is almost as good as a corner location. In fact we believe it is as good. We are not altogether pleased with the office arrangement and would suggest that you build a balcony over the stockroom and use this for an office. Then you would have an excess of room and could arrange a very nice ladies waiting room where it would be comparatively private.

There is room for only four cars besides those in repair although you could use the passageway between the service room and the showroom for the storage of a car when it is not being used.

We have indicated the position of three skylights which should with the front windows give you ample light in the shop. A small skylight and ventilator should be arranged above the toilet rooms and additional light above the stockroom and office section. If you install a balcony over the stockroom artificial light will be necessary underneath. You have not mentioned an alley at the rear of the lot and we presume there is no provision for light along this side of the building. However, if it is possible side windows would be sufficient for the lighting of the stockroom and office and if they can be installed in the garage and shop section, also, the skylights shown at the rear part should be moved to the center.

The roof is supported by four trusses in the usual way in order to avoid posts and to make the floor useful to the greatest extent.



*This is a much better arrangement than could be obtained upon an unequal area with 50 ft. frontage unless it should happen to be on a corner and even then there would not be much choice*

## LEGAL QUESTIONS ANSWERED

By Wellington Gustin

### PARTNERSHIP'S LIABILITY FOR DEBTS

Q.—I had formed a partnership some time ago but later it was dissolved by a personal agreement. During the partnership we borrowed \$200 from the bank. My partner and my brother and I signed the note and for security my partner mortgaged his car. Would I or my brother be held for the \$200 if my former partner fails? If so, does the banker take the car or have I the right to take it in payment for the note? There was no article of co-partnership made. I enclose a copy of the agreement that was made when we broke up in business.—Washington Reader.

Each partner is liable for the entire debts of the partnership. Besides each signer of the promissory note is responsible, because he is maker and principal.

The creditor is only entitled to his money loaned, and interest, and court costs if necessary to sue to collect. The car is mortgaged to the banker only as security—an additional probation for the lender. If you are required to pay the loan, you are only discharging your own liability imposed by the law of partnership, so you would not be entitled to the car. But, if you pay the banker creditor and have the mortgage assigned to you, you could chance holding the car under a claim of contribution from the partner. Where you pay a debt of the partnership, you have the right to call upon the other partners for their individual share of the obligation.

Regarding the partnership agreement for dissolution: The agreement that the one partner will assume all indebtedness of the firm is good as between the parties to this agreement. But creditors existing at the time of its execution are not bound by it to look to the one who assumes the debts. No contract to which creditors are not parties can limit the creditors from proceeding to collect against any of the members of the partnership at the time the debts were made. But since the mortgagor of the car assumed all the firm's debt, such an agreement is good between the partners, and under this additional agreement (additional to the partnership agreement) you should be able to take the car as any other creditor of the mortgagor, providing you get the banker to assign the mortgage to you. As assignee of the mortgage you would step into the shoes of the holder and could do no more than he—that is you could take possession only on breach or failure to pay according to the terms of the mortgage.

Again if you pay the partnership debt, in the light of this latter agreement, you can sue the other partner at any time for your money paid out. But from the standpoint of collecting your money it might prove advantageous to save the lien rights created by the mortgage. The mortgage is a lien from the date of its making.



# Answers to Readers' Questions

## Tuning Up the Car for Mountain Roads

Q.—I would like to obtain some advice in regard to engine cooling under heavy strain. In a trip through mountainous district for example, where there is considerable running in low and second gear, is there anything to do to the car beside checking up on fan belt, seeing that there is plenty of water in radiator, plenty of good oil in crankcase, ignition properly timed and hose connections in good shape in order to insure perfect cooling. Would there be any advantage in placing some cylinder oil in the gasoline tank?—C. B. Strohn, Box 372, Aurora, Ill.

The carburetor adjustment has something to do with heating. A very lean mixture, which will give maximum economy, also produces a flame of long duration and causes more heating than a mixture which is slightly richer. For this reason it might not be well to use the leanest mixture you can get away with, but have it just richened slightly. It is also advisable to check up on the brake rods to make sure that when the brake pedal is released that the camshafts in the rear axle return to their original positions so that the brake bands are perfectly released. It is of course desirable to have good piston and ring equipment, valves properly ground and bearings which are not excessively tightened. If there are no bearing knocks in the engine it would probably be a mistake to have the bearings worked on prior to such a trip. Having carbon cleaned out before entering the mountainous district might be a wise precaution.

## To Increase Speed Past 55 M. P. H.

Q.—Please advise how to increase the R. P. M. of a Flint 80 engine without changing the pistons or if we do use special light weight pistons, how much would they increase the speed. The engine will only turn over about 2750 R. P. M. and the car will only do 55 miles per hour.—Greve Motor Co., Lorain Ave., at W. 45th St., Cleveland, Ohio.

Light reciprocating parts are essential in high speed operation and we believe the use of special light weight pistons would accomplish your purpose. Just how much increase in speed you would get, however, we are not prepared to say. When you have the engine capable of turning at high speed the next thing is to get enough fuel into the cylinder to supply the necessary power. When you start to re-design an engine you have a big job before you, and to introduce more fuel would necessitate larger valves, larger intake manifold and ports, and larger carburetor. The pistons alone, however, will do some good. You might check up on your spark advance and see if you have enough to get spark knock at high speed.

If you cannot make the engine knock it is possible that you do not have enough range to the advance. The most efficient point would be just back of the position where you get a spark knock. Another way of getting more power from an engine is to increase the compression. This is done by removing material from the cylinder block or cylinder head depending upon which will reduce the space in the combustion chamber. Another way is to use a piston with a greater dimension from the piston pin to the top of the piston. This might necessitate the use of special fuel, however, to keep from getting a fuel knock due to high compression.

## WINTON VALVE TIMING

Q.—Please send us information in regard to the valve timing of a 1917 Winton car, model 22-A.—Brown & Rogers, West Harwich, Mass.

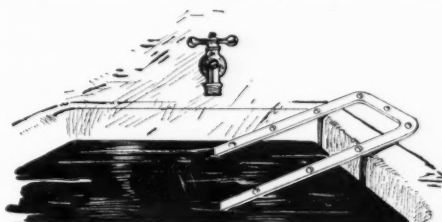
The intake opens 21 deg. after top dead center and closes 45 deg. after bottom dead center. Exhaust closes 12 deg. after top dead center and opens 54 deg. before bottom dead center.

The opening of any valve can be checked by putting a piece of thin paper such as cigarette paper between the tappet and the valve stem. When the engine is turned by hand the paper will be pinched whenever the valve is open. The opening of the intake valve is then noted by the instant at which the paper is pinched.

## SHOP KINKS IDEAS That have been Found Useful

### To Make the Gasket Fit

When cork gaskets are exposed to the air they often shrink and are hard to fit. If these are dipped in water for two or three minutes they will swell or expand to their original size.—R. H. Reed, Heaton, N. D.



Readers of MOTOR AGE are invited to submit ideas that they have found useful in doing some particular service job in the shop in a better or quicker way. For each one published \$2.00 will be paid. Whenever possible the idea should be accompanied by a sketch or diagram from which a drawing can be made.

## Gasoline Gauge Wanted for Gardner

Q.—Will you kindly give me the address of the gasoline gage manufacturer who makes a gasoline gage for the instrument board of a Gardner four cylinder 1925 car? I have written the K-S Telegage Co., and they do not make a gage for this car.—Ernest C. Dickens, Box 245, East Radford, Va.

Possibly some gauge manufacturer will see this inquiry in MOTOR AGE and get in touch with you or some of our readers may be able to give you the information. One possibility would be to get one of the electrically operated gauges used on the Chrysler Imperial, from some Chrysler dealer.

Q.—This car has a Lycoming five bearing engine and we would like to know the maximum speed of this engine and the maximum speed of the car. Would like to know the bore and stroke and how much oil it should use when in good condition.

This four cylinder engine has a bore of 3½ and a stroke of 5 in. We believe it should give you an oil mileage ranging from 100 to 150. We have no data on the speed or horsepower of this engine, but a similar Lycoming engine having a bore ¼ in. less is supposed to develop 42 horsepower at 2,200 R. P. M. We believe that this Gardner should do about 55 miles per hour and with a gear ratio of 4.8 and a tire 31 in. in diameter this would mean an engine speed of 2,860 R. P. M.

Q.—This car has disc wheels and 31 by 5½ balloon tires. We would like to know the weight of the car and the air pressure for the tires.

The air pressure will vary somewhat with the load. From tables published in the May 6, 1926, issue of MOTOR AGE, however, the pressure in the front tires should be somewhere between 30 and 38 lbs. and in the rear tires between 32 and 38 lbs.

## STRAINER ON FORD OIL LINE

Q.—Please advise me whether or not it would be all right to solder a strainer over the funnel of the oil pipe in a Ford. I think the strainer should not be too fine and should be put on in a rounded up shape. Tell me what you think about this and how fine should the strainer be if it should be put on at all. I have never heard of this being done, but why would it not be a logical idea?—Carlos Farris, Telford, Ky.

No doubt you have frequently noticed the instructions of different manufacturers cautioning operators to clean the oil strainer at frequent intervals. The location of the strainer as you suggest for the Ford would make it practically impossible to clean it and with the transmission band giving off a fuzzy and linty accumulation it is very likely that the strainer on the Ford oil line would clog up in a short time.



# Clearing Up Electrical Troubles

## Too Much Current to Battery

Q.—Supply information on Delco motor generator on a Buick. This generator charges too much. I have been looking through back numbers of Motor Age for a description of similar trouble, but all those described refer to machines which did not charge enough. A short time ago the ignition coil gave trouble and a new one was installed. Now the generator charges 30 amp. Before I could never get it to charge more than 12 or 13 with the brush moved as far as it would go. Now with brush moved as far back as it will go it charges 20 amp. at 25 miles per hour. This seems to be too much although the generator does not get very hot. I cannot see why the charging rate should be so high as the brushes are in fine condition and I can find no poor connection.—Henry Hons, 2001 Oak St., San Francisco, Cal.

You do not say what year Buick this is. However, the circuits have been the same for several years back. One end of the shunt field winding goes to the third brush and another end comes to a terminal from which a wire connects to the ignition coil. From the ignition coil a wire goes up to a terminal on the combination ignition and lighting switch. You could correct the condition by putting a little resistance in the wire between generator and ignition coil, although of course this would not be finding trouble, but would be merely a makeshift repair. One possibility is that the third brush holder is grounded. Would recommend disconnecting wire from brush and insulating it from the commutator and then testing with 110 volt test lamp to see if this is the case.

We do not see how the change in ignition coil would affect the charging rate unless formerly there was a very high resistance in the field circuit which is completed by the wire going to the ignition coil and that in making the change

Edited By A. H. Packer

you corrected this condition by making a clean contact. If you have moved the third brush to the limit of its travel you can bevel one corner from the brush so as to move the point of contact between brush and commutator back farther toward the insulated brush and away from the grounded brush. We are inclined to believe that a grounded third brush is the most likely reason for your trouble.

## DOES AMMETER TELL THE TRUTH?

Q.—We are having trouble with a Remy generator model 917 on a GMC 3½ ton truck. The generator quit working and would run the battery down very fast. We overhauled the generator and it charged 6 amperes on a test bench. On the truck, however, it discharged 6 amperes as shown on the ammeter. This system has a positive ground. Have tried to change polarity of generator without success. Supply wiring diagram and explain cause of this trouble.—I. K. Reishus, Drumheller, Alberta, Can.

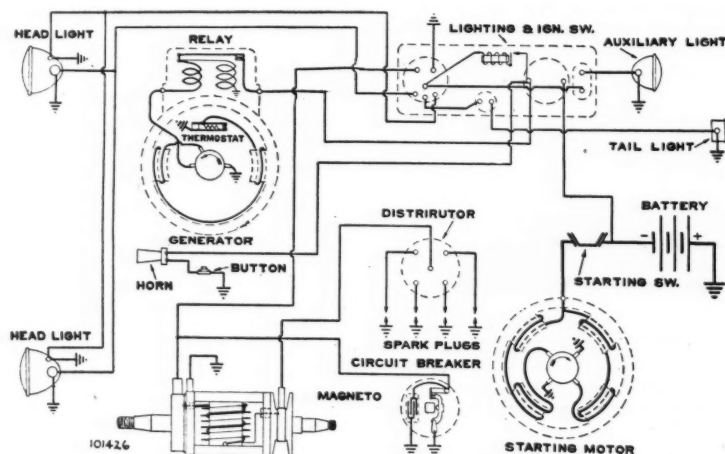
Suddenly discharging the battery would not be the fault of the generator unless the cutout points stick. We would suggest that there may be wiring trouble on the truck. It is also possible the ammeter is reversed or has been affected by a strong discharge current such as would be produced by a short circuit so that it reads in the reverse direction. When putting the generator on the car you should close the cutout points by hand. This will show you the direction the ammeter reads for discharge. Then it should read in the opposite direction when showing charge current. We suspect that the generator is O. K. and that trouble in the wiring runs down the battery. Wiring diagram is shown in accordance with your request.

## Locating Grounds in Ford Magneto

Q.—We are having trouble with magneto field coil in Ford magneto grounding to the frame. We just overhauled a Ford ton truck and put on new field coils. We installed new rear main bearing cap to take up end play and adjusted clearance between magnets and coils to .018 in. After 100 miles running the magneto went dead, and we find that the field coil is grounded, that is, there is a ground in addition to the regular ground. The coil assembly is not cut anywhere. We would like to know what causes the coil assembly to go bad.—Wisconsin Subscriber.

The usual cause of Ford magneto coils going bad and becoming grounded is small metallic parts in the engine such as stray cotter pins which are dropping into the flywheel housing when working on the No. 4 connecting rod bearing. These are picked up due to the attraction of the magnets and rotate with the magnets and occasionally get between the magnets and the coil. This causes the insulation to be rubbed from the coils and the cotter pins or other steel parts then complete the connection from the frame of the car to the winding itself. About the only other cause would be a field coil improperly insulated when first made. To test for grounded field coil you can remove all wires from the magneto post and connect a 6 volt battery as would be done in recharging the Ford magneto according to MOTOR AGE instructions.

If the 6 volt battery sends 12 amp. through the winding it shows a normal condition. If it sends 24 amp. it would show a ground at the bottom of the winding. This would indicate that the current was twice what it should be or that the current was only going through half of the circuit. If the current should be 4 times what it should be then it would indicate that the current is going through only 4 coils and then is getting to ground by means of some bad spot in the insulation. A bad spot in the insulation might be due to a coil being hammered over the pole piece so that the insulation was scraped off on the inside of the coil. If the coil assembling is out of the engine then it can be tested with 110 volt current with the normal ground disconnected. To find the defective coil it is necessary to disconnect at various places in the circuit and test a few coils at a time until the trouble is run down. It is essential to follow the details of MOTOR AGE instructions given for magnet recharging in order to prevent the 6 volt battery from weakening the magnets.



Wiring trouble can be checked up with this G. M. C. truck diagram

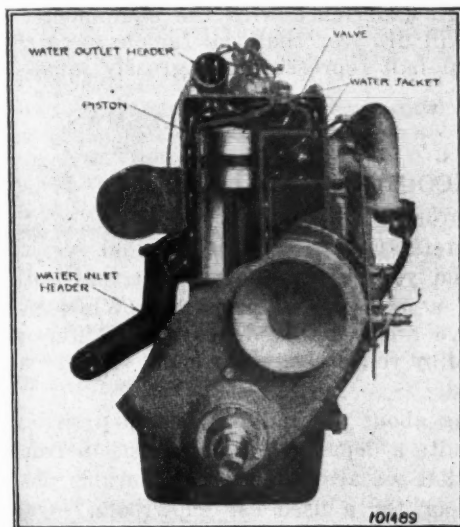
—From Remy Manual.

# Answers to Readers' Questions

## Piston Breakage Shows Mechanical Interference

Q.—Have been having trouble with a Hupmobile model R, 1924. Do not know what kind of pistons to use as standard pistons keep breaking. Wish you would recommend the best piston to use.—Giddens Motor Co., Tunica, Miss.

We do not believe that the piston will break unless there is something mechanically wrong in the engine. About



Hupmobile engine, section view

twice in the last four years we have had complaints of pistons breaking in other cars and always found there was some mechanical trouble. In one case the valve was striking the head of the piston which caused it to break and in another case the top piston ring would come out of the cylinder bore and catch so that the head of the piston was pulled off. We believe that something of this kind must be happening in your case, although you do not say just how the piston breaks or where the trouble seems to be. We are showing a sectional view of the model R Hupmobile engine and you will notice that the combustion chamber is of the turbulence type and causes the piston to come very close to the top of the combustion chamber.

Accordingly if you have had the connecting rods rebabbitted without getting them the proper length from center to center it may be that the piston very nearly touches the cylinder head. Then if a little looseness occurs in the bearing it may just barely strike at high speed. You might check this up by putting some putty or soft wax on the top of the piston and bolt the head in place. Then turn the engine over two or three times and remove the head to see what sort of an impression has been made on the putty or wax. In this way you

can check up the amount of clearance between the piston and cylinder head. Also check the cylinder walls to see that there are no ridges which would tend to catch the piston rings and cause them to put an abnormal strain on the piston.

## GETTING MORE FORD POWER

Q.—Would like to know if cutting the valve seats in a Ford cylinder block to fit Fordson valves and installing Fordson valves in the intake ports would increase the power of the Ford engine. If so, would it consume more gas?—Joe Bruner, 127 N. Van Buren St., Newton, Ill.

In general when you change the design of an engine so as to get more spectacular performance it costs money in the way of increased fuel. We believe this would be true to some extent in increasing the size of the valves, but the difference should not be enough to worry about. In general we believe it is advisable to use one of the overhead valve type cylinder heads rather than spend the time and money necessary to get the slight increase in size which Fordson valves make possible. However, these valves have been used in many cases and have effected some improvement in power.

## IGNITION FOR CAMP CAR

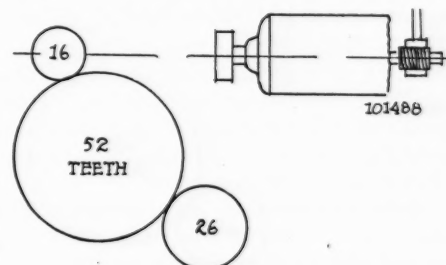
Q.—We have a Huffman truck chassis on which we are building a camp house. The engine is a Continental 4 cylinder, 3 3/4 model N. It is equipped with a magneto. We want some information on the gearing of the front end of the engine as we figure on removing the magneto and putting on a Chevrolet generator and distributor in order to have current for starting, lighting and power. The mechanical part of the installation can readily be made, but we are not sure about the rotation of the distributor shaft and whether it will turn at the right speed to give proper spark timing.—Warne-Martin Motor Co., 122 West Main St., Bedford, Va.

We do not believe the timing will be correct as the Chevrolet gearing is peculiar. We are showing a diagram to illustrate this. There are 26 teeth on the crankshaft gear, 52 teeth on the camshaft teeth, and 16 teeth on the generator gear. The camshaft on your Continental engine will of course turn 1/2 engine speed, which is true on all cars. This means that you must continue to rotate the generator using the ratio of 16 to 52 teeth. Unless you can maintain this ratio the generator will turn at the wrong speed and the distributor will not be timed properly, and the engine will not run. Other combinations between the generator and camshaft which would work are 12 teeth on the generator and 39 on the camshaft or 20 on the generator and 65 on the camshaft. Another suggestion is that you might get a magneto type generator and a source of supply on this will be given by separate letter.

## Piston Pin Knock or Camshaft

Q.—I have an Oldsmobile, 1923, 6 cylinder model which has a peculiar knock when driving about 20 to 30 miles per hour. This cannot be heard until the above mentioned speed is attained. I have checked the connecting rods and pistons. Rod bearings all seem O. K. Car has been driven about 7000 miles. Could it be in the camshaft?—A. J. Damm, Liberty Garage, Elk Creek, Nebr.

You do not say whether you checked the piston pins at the time you checked up on pistons and connecting rods. A piston pin knock usually shows up at the speeds mentioned but should also be heard at idling speeds. Camshaft bearing should not cause trouble in the mileage mentioned. You can check for camshaft noise, however, by applying pressure with a screwdriver at the side of the various valve tappets while you run the engine at various speeds. You can also try adjusting one push rod so that it just barely holds the valve open, or so that the push rod and valve stem just barely touch when the valve is down. You can check for piston pin slap if you can get the use of one of the knock testing devices which operate like a bicycle pump and alternately apply suction and pressure on one engine cylinder at a time. By this means the piston is rapidly jerked up and down and knocks are thus easily located while engine is not running. Additional information on a knock detector of this character will be given by mail if desired.



Chevrolet timing gear ratios

## CARBURETOR BOOK WANTED

Q.—Can you tell me the name of a good book that shows all makes of carburetors and their adjustments.—L. Vilatte, Fredrick Hotel, International Falls, Minn.

We do not know of any such book although we believe there is a big field for it. There are many carburetor books on the market, but they are devoted chiefly to carburetor principles and carburetor engineering. A book of this type would mean to the carburetor repairman what a wiring manual means to the electrical shop. If any MOTOR AGE readers know of any such carburetor manual we would like to have the name of it.



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## Letters to the Editor

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# Describes the Kind of Light Car He Would Buy

To the Editor of MOTOR AGE:

As there seems to be a new interest taken in the European type light car in this country I would like to offer some suggestions from my standpoint, that is the man who lives in town, owns a big car, and needs something to drive down to work in, and to use for general purposes too when the big car is in use.

The car that I suggest will be popular in many parts of the country because of the increasing good roads.

I was in hopes that the Overland Whippet would be something like I want, but the trouble with it is that it is too big.

Here is the kind of car I would buy in a minute if I could: 6 cyl. engine. 90 to 100 cu. in. displacement. No larger. Oil cleaner and rectifier. Air cleaner. Less than standard tread. Not over 5 ft. high. All steel body. 4 or 5 passenger. Four wheel brakes. Large balloon tires. Low to the ground. Fifty miles to the gallon.

Different manufacturers could bring out different ideas in higher priced small cars using front wheel drive, superchargers and highly developed 2 cycle engines. Franklin could make a good air cooled job.

The time is coming when we will have this kind of car. I for one want one right now, but hate to go to Europe to buy one. Will you tell the American manufacturers to wake up.

Yours very truly

Falls City, Neb.

F. T. MUDD.

## Car Manufacturer and Accessories

To the Editor of MOTOR AGE:

Much is said and written today about car manufacturers merchandising accessories. However, there is one phase of the proposition that does not seem to have been publicly uncovered—the insidious imposition and deception placed upon the consumer.

Take bumpers as an example. The car manufacturer buys cheap bumpers at a price so low that the bumper manufacturer does not know whether to rejoice over getting the business or whether his failure to get it would have been a blessing in disguise. With the bumpers other items are added to make up an enticing accessory package for the car buyer.

After slapping on a delightfully luscious profit, the car manufacturer passes this precious package on to the dealer who in turn adds a "dictated" profit. It is then ready for the consumer.

Ostensibly an innocent and legitimate transaction from the standpoint of the manufacturer. But what about the car owner who consummates the tail end of this deal? He is paying a quality list price and getting second-class merchandise. The cost of the bumpers, for example, is not revealed. He pays a lump sum for this group of essential accessories and naturally assumes that quality justifies the price; in fact, the package is presumed to be a bargain; a great benefaction which the car manu-

facturer is able to bestow on account of his tremendous buying power.

Eventually the car buyer is going to see the "nigger in the wood pile." He is going to do some intelligent figuring and through experience with the equipment in actual service, he will discover that the famous package is in reality a bit of bait representing a grossly inflated list price.

SALESMAN.

## Gives Recognition to Used Car

To the Editor of MOTOR AGE:

We are very grateful to you for the unusual service rendered by you and your company in connection with our construction of a new garage property. While the plans which we have finally adopted are some different than those submitted by you, we received much value from your plans submitted.

There is one thing about our building which probably to some extent is quite a departure in construction from other buildings in that we are using a considerable portion of the main floor for a used car showroom. Our business is one hundred per cent sales and service, and we, therefore, decided that we should rightfully provide practically as large and attractive a used car showroom as would be used for new cars.

We shall send you a blue print of our plans when they are complete. Undoubtedly you will be interested in looking these plans over.

Accept our most hearty thanks for the highly appreciated service which you have rendered us.

Yours very truly,

KAMMERER-CHENY, INC.

Mankato, Minn.

R. C. Cheney.

## A Word from Hawaii

To the Editor of MOTOR AGE:

Enclosed please find a postal money order to cover the cost of renewing my MOTOR AGE subscription as per enclosed bill. While this is a very tardy renewal, the matter was neglected in the rush of getting away on a trip to Honolulu and I am looking forward to getting some information on the Indianapolis race.

One can get immediate delivery of the latest model cars here while every boat brings a new supply, resulting in numerous vacant lots full of used cars which sell for about twice what they would bring in or near San Francisco. While gas is a cent a gallon less than in San Francisco, the fact that the Territory license fee is 1 cent per pound of car weight and drivers' licenses \$5.00 a head, it pays to bring one's own car from the mainland.

Sincerely,

Honolulu, T. H.

CARL W. SPRING.



# NEW TIME SAVERS FOR SHOP

## A New Hoefer Machine

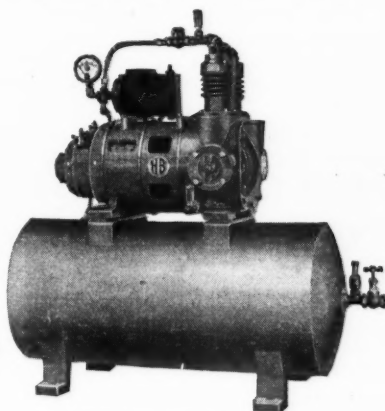
A special double end, drilling, boring and reaming machine constructed for the accomplishments of accuracy and rapid production is offered the shop owner by Hoefer Manufacturing Co., Inc., Freeport, Ill. This device provides cutters for roughing and finishing the surfaces to be machined. There is an adjustment which permits accurate setting for depth and which compensates for the grinding of tools. A cluster of eight drills surrounds the roughing tool in each head so that simultaneously with the rough boring operation two groups of eight holes are being drilled in each end of the rear axle for attaching the brake units. A motor is mounted in the base of the machine. Thorough lubrication is provided.

An interesting feature is the work holding fixture. This is mounted in the center of the machine. The work is placed in this fixture with a rapid action of the double handle lever and locked into position. The fixture enables the shopman to move the job to correct position for the different operations.

While this machine was designed for a particular job the makers say it may be readily used for a variety of work of similar character.

## New Hobart Air Compressor

Hobart Brothers Company, Troy, Ohio, claims particular merit for the new "HB Junior" Silent Twin Automatic Air Compressor. This is a typical "HB" single unit compressor with "HB" 1/2 h.p. ball bearing motor built into an "HB" twin cylinder beltless compressor. It has the "HB" spiral bevel transmission running in oil. The outfit has a capacity of two cu. ft. per minute and is mounted on a heavy duty 22 gal. tank in a horizontal position. The entire outfit is 38 in. long, 14 in. wide and 36 in. high, neat in appearance and it occupies little space. It is provided with the characteristic "HB" equipment. The price for the outfit is \$148.



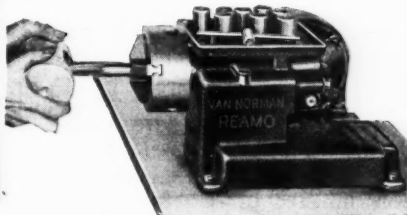
"HB Junior" compressor

## New Power Reamer

The Van Norman Machine Tool Company, Springfield, Mass., announces a power operated reamer known as "Reamo." This outfit comprises a chuck driven at 30 R. P. M. by means of a 1/4 horsepower motor. The speed is reduced through gears to a worm and worm wheel, running in a bath of oil. The chuck will hold reamers from 1/2 in. to 1 1/2 in. in diameter and power is sufficient to ream these diameters through bronze. The piston or connecting rod to be reamed is held in a natural position at the waist line so that reamer enters and follows through one or both bearings in a straight line. The work is withdrawn while reamer is still turning, leaving no marks on bushing or bearing. The price with 110 volt or 220 volt motor is \$98.50. For 25 or 40 cycle single phase motor add \$4.



Dreadnaught tire chain tool



Van Norman's new reamer

## Dreadnaught Tire Chain Tool

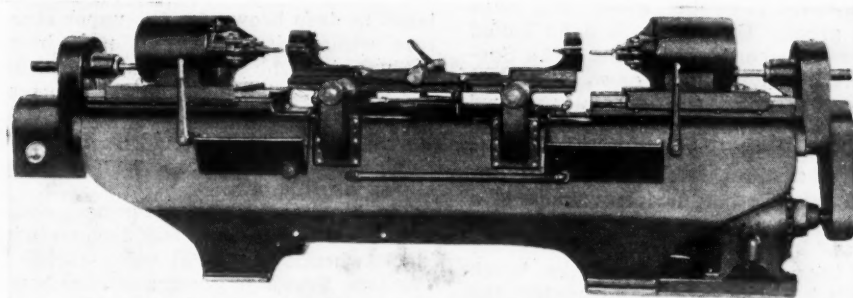
Made by the Columbus McKinnon Chain Company the Dreadnaught Tire Chain Repair Tool is designed for repairing all sizes of pneumatic tire chains. Replacements and repairs with this device are said to be quickly and thoroughly accomplished. As the shopman's time is highly valuable and as patrons frequently wait for chain repairs it is pointed out that the time-saving feature of the Dreadnaught is well worth the shopman's consideration.

The leverage of the tool is such that it may be easily operated by anyone. The solid parts are of semi-steel and of ample strength to prevent breakage. One of the jaws is fitted to open the hooks and the other to close them. This tool is attached to a bench and should be installed at least 15 inches from the bench front to permit the chains to be spread out in front of the operator. It has interchangeable parts and parts may be replaced. The Dreadnaught complete is priced at \$12.

## New Wilkie Rod Gage

Announcement has been made that the Wilkie Machine Works, making precision garage equipment at Winona, Minn., for more than 12 years has changed its name to the Continental Machine Company and now is located at 1301-3 Washington Avenue, south, Minneapolis, Minn.

The Continental Machine Company is producing a new device which is known as the "New Wilkie Rod Gage" which is said to correct error in any rod in very short time. This machine is declared to render exceptionally efficient service as an arbor-type aligner. It may be fastened to the work bench, being easy to move from one job to another and standing up anywhere the garageman wishes to work with it. A universal bender is furnished which takes the bend out of a rod by tightening a set screw without subjecting the machine to strain. The arbor remains attached while testing a complete set of rods. This machine is made of the best iron and steel, all working surfaces being ground and the makers claiming accuracy to a ten-thousandth. Prices \$39 and \$49.



New Hoefer machine for drilling, boring and reaming

## Growler Armature Testing Explained

(Continued from page 13)

"Yes, you can find those also," said Red. "When you experiment with the armature you can try the point of the hacksaw blade wedged between bars and see what position around the commutator gives the best flash. Then test all bars at that position as the armature is turned. Some armature testing machines use an A. C. ammeter for accurately measuring the bar to bar short circuit current.

"In this illustration (Fig. 2) the upper end of coil A is shown disconnected from bar No. 2. If the lower end of coil B were also loose or disconnected we would have bar No. 2 disconnected from the whole winding and we would accordingly get no flash whatever when shorting from this bar to No. 1 or No. 3. With the condition shown, however, we should get a faint flash or a low meter reading for while coil A is disconnected, there is a circuit to other coils in the armature winding and while these theoretically balance each other, the balance is not perfect and there is usually a slight indication of current.

"A ground test can either be made with 110 volt test points or it can be made in the growler by shorting from various commutator bars to the shaft of the armature. At certain bars there will be a flash or a meter indication if an A. C. ammeter is used. At the bars connected to the grounded coil the lowest reading or the faintest flash will be obtained."

## All-around Service Built This Business

(Continued from page 11)

used for involving, etc., and afterwards filed alphabetically in dead file for future reference in mailing and checking up customers who do not return.

While work is being done, customers are rented spare batteries at 25 cents a day. As soon as their work is done postal cards are sent in confirmation of telephone notification.

As the returns of this department show, the three baterymen were responsible for a revenue exceeding \$8000 in the first six months of operation.

General publicity is of great value to this class of service business because quite a large proportion of it is transient. Any visitor to Nashville will be struck by the

large number of red spare tire covers in use on automobiles. These bear the name of the Hancock Tire Co. and are given to each customer purchasing a tire.

This tire cover Hancock considers his best advertising medium, no less than 200 a month being disposed of.

In conformity with this tire scheme, all the Hancock cars are painted red. The runner cars are kept looking smart by being repainted—surface coats only—three times a year at a cost of \$45 per job. These machines standing outside the premises make a very attractive display.

Small pictures of the tire covers are used on all stationery, including envelopes, so that the effectiveness of the personal letters which are used for direct mail advertising is increased by the obvious tie-up.

In addition to the goodwill created by the extra attentions of the service men in the shed, the hot weather finds a little colored boy in white overalls handing round cooling drinks. Courtesy, cleanliness, speed, and such additional services as cleaning and painting batteries sent in for charging, make just that difference to revenue that good workmanship alone can not accomplish.

## Dealers Give Luncheons to Owners

The Perry Motor Company, Dodge Brothers dealers in the Dallas district, has adopted the plan of having car owners keep closely in touch with its establishment

Recently, as one move along this line, E. Gordon Perry, president of the company, was host to Dodge Brothers owners at a luncheon in the cafeteria of the big four-story establishment housing Perry activities. After the luncheon the guests were taken through the establishment with a view of showing them just how well the company is prepared to sell and deliver new and used cars and to service them after they are sold.

Mr. Perry made a short talk in which he told the car owners of his policy of selling used cars without profit which customers wish to trade in on new Dodge Brothers cars in case the company and customers can not arrive at a trading agreement.

The gathering was just one of several held at the Perry establishment and one of many to come, all calculated to create a better feeling between the company and Dodge Brothers owners or prospective customers.

## Chandler Line Now Includes Standard, Special and Big Six Models

(Continued from page 23)

tone sage brush green and upholstered in blue gray mohair. This car has inlaid walnut panels fitted beneath each of the four windows.

The special six two passenger coupe is finished in black. Optional color choice is two-tone Brewster green and sage brush green. Upholstery is hand buffed leather with corduroy option. The Special Six DeLuxe coupe for two is finished in two tone green with specially striped black bead. Wheels are Brewster green with gold stripe. Blue gray mohair is used and walnut inlaid panels are included as on other models. There is a five passenger touring in two tone brown and hand buffed leather and a Special Six sport touring in two tone sage brush green with disc wheels to match the body.

### Bodies on Standard Six Chassis

There are seven body models available

on the Standard Six chassis which is powered with a 3½ in. by 4½ in. six cylinder engine. The price range is from \$945 for the five passenger touring to \$1135 for the sport roadster. The Standard touring car is finished in two tone deep brown while the DeLuxe touring is finished in two tone sage brush green and has natural finish wood wheels. The new Standard Six Roadster which is similar in appearance to the Big Six Comrade roadster is also finished in deep brown for the upper structure while Nevada gray is used below the upper bead. It also has natural finish wood wheels as standard equipment. Upholstery is hand buffed Spanish leather to harmonize with the body color. A rumble seat for two passengers is included on this car.

The Standard Six two passenger coupe is finished in blue and buff lacquer with black wheels. Optional color choice is two tone Brewster green and sage brush green. This model is upholstered in hand buffed leather with corduroy as an optional choice. The Standard DeLuxe coupe for two comes in two tone green

with black bead specially striped. Wheels are Brewster green with gold stripes. Upholstery is mohair and walnut finish door panels are included on this model. The Standard Six Sedan for five passengers is finished in Lotus blue and black lacquer with gold stripes. Optional color choice is dark Cleveland blue. Upholstery is gray broadcloth. The Standard Six DeLuxe sedan also accommodates five passengers and is offered in Brewster green and sage brush green lacquer. Wheels are Brewster green with gold stripe. Upholstery is durable gray green mohair and walnut inlaid panels are included in the interior finish of this car.

### Distributes Race Car Parts

CHICAGO, Aug. 7.—Distribution of the complete line of Ford special racing parts made by the Green Engineering Company of Dayton, Ohio, has been taken over by Andy Burt, Inc., 2103 S. Michigan Ave., Chicago. This line is very complete and extends from special connecting rods to goggles. Some special parts for Chevrolet and Dodge Brothers cars are also handled.



# EDITORIAL

## There Is No End to Progress

ANYONE who thinks the ultimate in automobile design has been reached has another think coming. Week after week for more than a quarter of a century MOTOR AGE has recorded the progress of the automotive industry and today the industry is just as full of adventure and discovery and romance as it was in 1900.

The new things being offered today do not in any way discount the value of the old. The utility and beauty of the automobile of two years ago with its high pressure tires and somewhat gruff though powerful performance is not to be questioned, and thousands of cars of that day are still giving useful service.

But the car of today offers riding comfort, ease of steering, smoothness of performance, economy and durability hardly thought possible until our engineers actually demonstrated the results of their constant studies.

And so we have today the same widespread public interest in the new models of automobiles that we had a decade ago, but the public interest today is even more pronounced because of the more intimate manner in which it touches the vastly increased number of car owners.

As Buick says, it is the new and better things that stir the people's hearts.

## Some Things to Think About Now

THIS is the month of August. Nearly every place in the United States it is hot enough that little thought is given to the winter we all know is closely approaching.

For the automotive dealer who plans his business progress and success, now is the time to do a little winter thinking. What of the sales possibilities and what should he do to prepare for cold weather?

First of all there are certain commodities that will be in demand as winter approaches. Intelligent merchandising effort directed toward those commodities early enough will enable the dealer to profit by the public acceptance of these commodities and increase his sales considerably over what might otherwise have been the normal demand.

Cold weather means an extensive normal demand for anti-freeze materials, heaters, chains, robes, suitable grades of lubricants and other seasonal items. The wise dealer is now selecting his dependable sources of supply for these commodities, placing his orders and planning his sales campaign that will give him a large share of this business.

## One Essential for Flat Rate Success

THE service shop that expects to make a success of flat rate operation must have good equipment consistent with the volume and type of work done. The service manager for Pence Automobile Co., whose success with flat rates was told in a recent issue of MOTOR AGE, says:

"In order to get the most out of flat rates it is absolutely necessary to have the most efficient and labor saving tools. Any suggestion that a mechanic may make is checked up

and if worth while is adopted. In the shop we have many labor saving tools of our own construction and are continually on the lookout for anything that will produce a better job or reduce the time of any operation."

The selection of tools for the flat rate shop is important and worthy of deliberate consideration. It is necessary to have certain labor saving devices and yet the investment in equipment must be kept in accord with the potential earnings of the business. One thing is important: Every item of equipment purchased for the shop should be the product of a manufacturer whose reliability is without question. Close observance of this rule will go a long way toward protecting the investment.

## Flat Rate Forges Ahead

A SIGNIFICANT article in the August 5 issue of MOTOR AGE related the experience of the Pence Automobile Co. with the flat rate method of selling maintenance and paying mechanics. Briefly the results have been:

Shop does 45 per cent more work with 40 per cent fewer mechanics.

The service department is a regular profit producer.

Average earnings of mechanics are 21.2 per cent higher than before flat rate system was adopted.

Complaints from customers are rarely heard.

The dealer who says it is impossible to make a service department profitable has in this record a pretty strong argument to swallow.

## A Little Independent Thinking Will Help

THE retail automotive dealers of this country constitute the most important factor in the continued prosperity of our vast automobile industry. As a group they have performed wonders in the sale and distribution of a tremendous volume of merchandise. But in their modesty they do not appear to be fully conscious of their power. They possess undoubted power to influence manufacturers in the kind of products they provide and the methods they use for distribution. The dealers should not hesitate to use their influence in the direction of obtaining the best merchandise and the most economical and profitable methods of distribution.

## The Closed Car Still Gains

DESPITE the popularity of certain types of roadsters and sport phaetons the closed cars still gains in the esteem of the public. Sales of passenger cars in the General Motors line for the first five months of this year averaged 79.8 per cent closed as compared with an average of 63 per cent for the entire year 1925. Closed car sales were 43 per cent of the General Motors total in 1924, 37 per cent in 1923 and 28 per cent in 1922.

Let the dealer who is offered open cars in trade remember these figures.



# MORE PROMISING CONDITIONS

## New Cars Hit July Slide But Future Looks Good

### Fine Agricultural Situation Points to Prospect of Greater Rural Sales

With the exception of some localities in the south a decline in new car sales in July, compared with June, was experienced by the trade in practically all sections of the country. It was a seasonal situation, however, and reports received by MOTOR AGE indicate that for the trade generally July's volume was better than for the same month of last year.

While many dealers contended with a used car problem in July resale stocks on the whole moved better than in June. Special sales and campaigns played prominent parts in July's used car push, such efforts being especially conspicuous in cities reporting more decided improvements in the used car situation.

The most pleasing feature of the survey made through MOTOR AGE correspondents relates to the future outlook which is cheerful. Agricultural and industrial conditions which have been more or less uncertain promise good things for the rest of the second half in nearly all regions. The mid-west crop prospect is very good and there are plenty of indications over the nation generally that the rural buyer will be a factor in the automotive market in late summer and fall.

Reports from key cities follow:

#### Kansas City

The great wheat crop of Kansas City territory, and the prospect for splendid corn production, have radically changed the outlook for summer and fall business in automotive lines. Roughly about \$500,000,000 is the estimated grain revenue for this year.

The money already is flowing into the banks, and into trade channels, from wheat crops.

While in a few cases wheat growers have been made wealthy by their crops, securing far more than enough to pay for land, in general the situation is merely one of substantially better conditions for farmers than for several years.

It is said that farmers are not paying off the whole of their bank obligations with this money, but are buying farm equipment, and are spending some of the money for better motor cars, radio, etc., which they have had to forego for several years. The prospect is for a big

gain in automotive sales over 1925 for the year, the business continuing good as the crop money circulates through elevator hands, mills, bakeries, small-town and city stores.

The new car business of July was very close to the volume of June this year, and better, by perhaps ten per cent, than July, 1925. Used car sales were at least 25 per cent better than in July, 1925, a factor being a used car week this month when dealers pushed sales, and a local newspaper contributed pages of advertising for used cars. This emphasis on used cars contributed to new car sales, and also very greatly increased the accessory volume.

#### Denver

Conditions in this state are rapidly getting back to normal. Crop harvesting is commencing, and record crops are assured. All dealers report a general feeling of optimism, and the expectation of the best fall business in many years. Used car business is ahead of last year's mark at this time.

New cars are still slightly behind due to the slump in the early part of the year. Collections are somewhat improved over June. Truck business shows a substantial increase over June, and is about even with last year.

Conditions seem to be at a general level all over the state. Crops are good everywhere. Beets are contracted at a high figure, and there is an excessive acreage, so the factories are preparing for extra long campaigns, assuring plenty of employment in their districts during what might otherwise be slow months.

#### Cleveland

Sales of automobiles in the Cleveland district took a decided drop during the latter part of July although the first half of the month witnessed active demand for both new and used cars with the possible exception of the lower-priced used cars. Some dealers and distributors attribute the slump to the fact that many buyers are holding off until they learn what the different plants have to offer in improved models.

Others attribute the slowing down of business to the general mid-summer dullness. Several thousand men have been kept out of employment all summer because of the building strike and hundreds of these are potential motor car buyers. Many of the factories, aside from the automobile industry also are running short shifts.

Truck sales continued active until the latter part of July. Because of its wide diversity of industrial interest Cleveland has long been a good truck merchandising community and, while some lines may be in a slump there are always enough others at capacity with transportation problems for which the motor

truck is the only solution. The fact that steel mills near Cleveland are making summer records for production has also acted as a stimulus to the truck industry.

#### Portland

From an authentic report compiled by the Lumberman's Trust Company bank of this city it is shown that automobile dealers of Portland have had an unusually good year so far. Total sales up to August in the state of Oregon, most of which clear through Portland, were 16,997 automobiles, as compared with 13,962 for the same period in 1925. Multnomah county sales for this period are 6043 for 1926, compared with 5578 for 1925. Automobile and accessory dealers look forward to a \$150,000,000 year in Oregon.

A disturbing factor this spring among some of the dealers has been the over-expansion of the sub-dealer program. In a number of cases factories have demanded more representation than the market justified by requiring eight or ten exclusive dealers in the Portland field.

The used-car situation is showing an improvement. On May it is estimated that local dealers had on hand 50 per cent more used cars than ever before in the history of the business. Prices were reduced and sales campaigns were instituted with the result that the situation is improved to a point where today the used-car inventories are little if any above normal.

Accessories houses are a unit in reporting a substantial increase in business over last year.

#### Milwaukee

The same conditions that always affect passenger car sales adversely in July are expected to make August sales unusually heavy. The season of changes in models, with factories giving dealers an opportunity to clear their floors of merchandise, let down the sales volume of several of the largest makes, whose distributors and dealers went through the last half of July with practically nothing to sell. Dealers whose factories announced new stuff during the month of July have been hard pressed to make deliveries. On the whole, sales are believed to have exceeded those of July, 1925, numbering 2,194 in Milwaukee county, and 10,842 for the entire state of Wisconsin.

In August, 1925, Milwaukee county sales were 1,356 and Wisconsin state sales 5,995, and every dealer feels secure in predicting that this August will show a gain anywhere from 40 to 65 per cent over a year ago.

Conditions at the end of July were certainly more favorable than at the beginning of January, and sentiment greatly improved over that at the beginning of April.

The local industrial situation continues

# BRIGHTEN BUSINESS OUTLOOK

very favorable, with still a scarcity of skilled men for metalworking plants especially. Employment is again on the upgrade.

In a general way, the automotive trade can look forward to August with much greater encouragement.

The truck situation is generally reported as very favorable. Heavy duty trucks have been selling heavily. Commercial or light delivery cars are at least holding their own. Fleet sales are not as numerous as a year ago.

## Chicago

Retail sales of passenger cars in the Chicago territory took a seasonal dip in July, the recession of business compared with June amounting to something like nine per cent. It was simply a continuation, however, of the usual summer's slump in selling activity which began in June.

According to figures in what may be considered a good cross-section of this district's time sales for the different months the peak of retail buying interest was reached in May, that month showing an increase of about eight per cent over April, with June dropping under May about nine per cent and with the drop of about nine per cent in July.

New model introductions have sustained brisk business for some dealers and others are preparing for a pick-up with their introductions. While July's sales were smaller than June's, business for that month was ahead of July, 1925, considerably and sales so far this year have exceeded those of last year to this point. Many Chicago dealer's are stocked up too well on used cars. Excessive resale stocks also are noticed in the truck field. Truck business also slumped considerably in July compared with June.

General conditions in this section are pleasing and the outlook for the rest of the second half is good.

## New Orleans

A survey of the retail trade in New Orleans indicates a drop of between seven and eight per cent in the sale of new cars in July from that of June. There has been, however, a greater volume of sales of used cars, due perhaps to the fact that a number of the large dealers have put on special used car sales this month. Tire dealers report a noticeable increase in the sale of tires over last month.

However, on the whole here in the automotive trade generally the volume of sales in July was comfortably larger than for the same period of last year. The used car departments particularly are in better shape, and all dealers report their collections better than for the same time last year and the year before.

Sales of trucks, both heavy and light are about eight per cent less for this month than for June, but is about twelve per cent above the same period of last year. The slump in the truck business

is simply part of a general slump in business in this section in July. The volume of sales of lighter class trucks seems to be increasing proportionately more than the heavier style trucks.

Accessory dealers report that contrary to their expectations there was no noticeable slump in the accessory business during July, the volume of business remaining about the same as in June, and considerably better than for the same period of last year.

Battery dealers are optimistic over the present outlook.

## Birmingham

Conditions among automobile and accessories dealers in this territory are exceptionally good according to reports from automobile row. Business has shown a steady gain, the month of July being reported as slightly better than June in some establishments and just as good in others. While the July business has been only slightly better than the June business it is decidedly better than July of last year, the dealers report.

The greatest increase in demand has been for the smaller and less expensive cars though the dealers in the more expensive makes stated that business throughout the month was good. They were optimistic over the outlook.

Demand for used cars has been better this month than it was last and dealers feel that this problem will not loom so large as it has in the past in this market. Trade-in policies have been more strict.

Credit conditions are very good. There have been few repossessions and the few that have been recorded have been mostly on used cars.

Tire, accessories and supplies dealers say that business is excellent. Pleasing reports from automobile row are a natural reflection of the general conditions that prevail throughout this section.

Dealers in motor trucks in Birmingham say that business in this line is excellent throughout Alabama, that activities in other lines are good, that many businesses are expanding and that this condition creates a demand for motor trucks.

## Charlotte

Prospective changes in models of automobiles and reductions in prices of tires, combined with generally dull seasonal conditions, imposed restraints in the automotive trade through July and the month ended with sales of new cars slow, while used cars were moving slightly faster, with the month's volume reported to be substantially under that for June. The advent of several new models late in July and early in August was expected to result in a material improvement in the demand for new cars for those lines.

The sharp and continued decline which first was felt late in May apparently has exhausted itself. The trade in this locality is about at the bottom of the slump.

Dealers in tires reported that trade now is at its low point for the year and recent favorable developments within this industry are expected to hasten the arrival of the usual fall increase in sales.

Dealers and distributors of storage batteries reported that the smaller towns in these two states are doing a fair business, while the cities generally are having poor business.

Sales of accessories are light, and not much improvement is expected, it seems, before September 1.

Conditions in the truck field reflected the seasonal dullness in agricultural and manufacturing industries in the Carolina territory as July closed. Building operations slumped in July, serving to further depress the demand for trucks.

## Salt Lake City

The used-car situation throughout the state is better than it was some weeks ago, much better in not a few cases. Dealers that have been carrying fifty and a hundred cars have succeeded in reducing their stocks to ten or 20 in some instances.

Here and there, however, heavy stocks of used-machines are still to be found. The used car situation on the whole is likely to be better here from now on.

Dealers are insisting upon better treatment at the hands of those having used-machines to trade-in, whilst the buying public has more confidence in a used-car offered for sale by a dealer than ever before.

The sale of new cars is not as heavy as sometime ago but is holding up well. Industrial conditions are good and there is more tourist business than ever before.

Competition continues keen in the automobile industry here and unusually aggressive sales methods are still being employed. Some of the dealers have been taking rather long changes, but on the whole they are more conservative than before.

## Columbus

Sales of passenger cars in Columbus and central Ohio during July were about equal to those of June of this year and were in excess of sales in July of last year. This is obtained from a survey of larger dealers and distributors, covering central Ohio. Business was about 10 to 20 per cent ahead of July of last year on the average.

The spotty demand which was apparent during June has gradually passed away with a betterment in employment conditions and now dealers as well as distributors report a steady demand. The higher priced cars which had been rather slow earlier in the year has taken on new life and sales are gradually increasing. The great increase in business over a year ago is seen in low and medium priced cars.

Several distributing factors appeared

(Continued on page 40)



# EXPORTS FIRST SIX MONTHS SMASH

## New Record in Foreign Shipments by U. S. Plants

Increase of 9.4 Per Cent in Overseas Volume Made by July 1

WASHINGTON, Aug. 9. — All automotive products exported from the United States during the first six months of 1926, having a total valuation of \$182,066,573, showed a gain of 9.4 per cent over those shipped abroad during the first half of the peak year 1925 which were valued at \$166,457,821, according to revised figures just made public by the Automotive Division of the Department of Commerce.

"It is interesting to note," says a statement issued by the division commenting on the statistics, "that truck and bus exports from both the United States and Canada showed much greater gains than did those of passenger cars."

During the first six months of the current year 126,426 passenger cars were exported from this country as compared with 118,170 during the same period of last year, a gain of 7 per cent. Canadian shipments, on the other hand, declined, there being 28,439 passenger cars shipped during the first six months of 1925 and almost 4 per cent less this half-year when 27,346 were exported.

A 50 per cent gain is noted in shipments of trucks and buses from the United States, for the periods under review; 23,294 and 35,053 were exported during the first halves of 1925 and 1926 respectively, the greatest increase being in those valued under \$800. Canadian trucks and buses numbering 11,345 were shipped overseas from January to June, inclusive, this year, or 58.2 per cent more than the same period of the year preceding.

### Ayres Oakland Works Chief

PONTIAC, Aug. 9.—Fred W. Ayres has been appointed works manager of the Oakland Motor Car Co., A. J. Brandt, vice-president in charge of operations, announced.

Last December Mr. Ayres joined Oakland as plant analyst. For six years previous he was vice-president in charge of manufacturing of the Klaxon Division of General Motors Corp. He has been associated with the industry since 1907 when he was affiliated with W. S. Motors, manufacturers of Stoddard-Dayton and Thomas Flier.

From 1912 to 1914 he was retail branch manager for Oakland, at Wilmington, Del. In 1914 he became affiliated with the DuPont Co. and during the war was

in charge of the DuPont high explosive shell plant at Repauno, N. J.

He joined General Motors in 1916, engaging in industrial engineering and plant survey work for about four years and was prominently identified with construction and plant layout of the new Cadillac factory. From Cadillac he went to Brown-Lipe Chapin Co., where he continued industrial engineering work. He was transferred to Klaxon in 1920.

### Two Lyon Appointments

AURORA, Ill., Aug. 9.—Two appointments have recently been made to the field staff of the Lyon Metallic Mfg. Co. of Aurora. William P. Savage will represent this company in Metropolitan New York, southern Connecticut, eastern Pennsylvania, New Jersey and Delaware. W. J. Rowe will service western Pennsylvania, New York, Vermont, New Hampshire, Massachusetts, northern Connecticut and Maine.

Mr. Rowe was formerly with Stevens & Company, New York City, while Mr. Savage previously represented the Terrell Equipment Company of Grand Rapids, Mich.

### Graham Output Heavier

DETROIT, Aug. 9.—During the first six months of 1926, Graham Brothers in their four plants in the United States and Canada, manufactured 19,666 trucks and motor coaches. For the same period in 1925, production in these plants aggregated 10,477.

During the second quarter, production totaled 11,645 units compared with 8,021 units during the first quarter or a gain of 45.2 per cent. For the second quarter a year ago, production totaled 5,671 units, making the gain for the corresponding period, this year, 105.3 per cent.

### New One-Ton Standard

DETROIT, Aug. 9.—The Standard Motor Truck Co., has added a new one ton, six cylinder truck, known as the Fisher Junior Express, to its line as a companion model to the Fisher Fast Freight, 1½ ton chassis.

The new truck is powered with a Continental six cylinder motor, spiral bevel gear type rear axle and is equipped with balloon type truck tires. A feature of this model is that it will take a body nine feet in length without overhanging, there being 108 in. of frame back of the driver's seat. The car is capable of 30 miles an hour and speedometer and spare rim are part of the regular equipment.

### Owen Leaves Dodge Brothers

DETROIT, Aug. 9.—Percy Owen has resigned his position as director of foreign sales of Dodge Brothers, Inc. Mr. Owen assumed this position about a year ago after leaving the United States Department of Commerce where he was chief of the automotive division.

### Busy at Kissel Plant

HARTFORD, Wis., Aug. 7.—The Kissel Motor Car Company, Hartford, Wis., is running at maximum production with sufficient orders on hand to assure capacity production until the winter months, according to a report from the factory.

G. A. Kissel, president of the Kissel company, is enthusiastic over the outlook for the balance of the year and also the reception being accorded the new Kissel line introduced Aug. 1.

"We are exerting every effort to speed up production to meet the demand," said Mr. Kissel, but have at the present time more unfilled orders on our books than any time since the car period.

"I cannot help but feel that the entire industry will enjoy a prosperous fall and winter as every indication points in this direction. Easier time money, prospects for good agricultural prices and crops, heavy building programs in most cities, and with industries running on a normal basis, places the public in an optimistic mood which will undoubtedly reflect in increased automobile sales during the balance of the year."

### Ford Passes Fourteen Million

DETROIT, Aug. 9.—The Ford Motor Co. on July 21, passed another million mark in its production when motor No. 14,000,000 came off the assembly line at the Fordson plant.

That Ford still is maintaining production on a tremendous scale is indicated when it is considered that the ten millionth Ford was produced June 4, 1924. In the 25½ months time elapsing since then, Ford output has totaled 4,000,000 cars.

On Oct. 1, 1908, the first Ford Model T was built, and it was seven years later, Dec. 10, 1915, that the first million had been produced.

### Making Bus Bodies

CLEVELAND, Aug. 9.—One of Cleveland's older manufacturing establishments, the Baker-Rauling Co., has recently commenced the manufacture of bodies for motor buses in the chair car, city pay-enter and double-decker types. E. J. Bartlett is president and general manager of the company, while E. J. Stahl, the manufacturing vice-president, has charge of the new division just created.

### Pierce Earnings Higher

BUFFALO, Aug. 9.—Pierce-Arrow Motor Car Co. reports net income of \$474,861 for the quarter ended June 30, after depreciation, federal taxes and all charges. This compares with \$328,982 in the preceding quarter, and with \$364,714 in the second quarter of 1925. For the first six months of the year net income was \$803,843, comparing with \$502,131 in the first half of 1925.

# HALF'S HIGH MARK IN PEAK YEAR

## G. M. Earnings Beat Steel's

NEW YORK, Aug. 7.—General Motors Corporation has now far outdistanced Steel hitherto the acknowledged industrial leader of the country, not only in stock market valuation but also in total earnings and in earnings per share of common stock.

For the first six months of 1926 General Motors earned \$89,463,031, or more than double the United States Steel earnings on its common stock of \$41,113,661. The totals were equal, in General Motors' case, to \$17.53 a share, a gain of 92 per cent over the corresponding period last year, against Steel's earnings of \$8.09 a share, a gain of 35 per cent.

Putting the comparison on a basis other than that of earnings reported for the respective common stocks, it is shown that in the first six months of this year General Motors' total earnings, after all charges, were \$93,286,000 against Steel's total earnings, after charges but before interest, of \$67,204,000, despite the fact that the motor company's investment is considerably smaller.

Its invested capital on December 31, 1925, was \$464,634,296, while Steel's invested capital the same date was \$2,139,926,287.

## New High for Paige-Jewett

DETROIT, Aug. 12.—Shipments of Paige of Jewett cars during the first six months of the year established a new high record for the Paige-Detroit Motor Car Company. The total shipments were 27,015 cars, surpassing the company's previous best record for six months, made in the first half of 1923, when the total cars shipped were 24,996.

## Another Plant for Pontiac

OSHAWA, Ont., Aug. 7.—Announcement has been made by Gordon Lefebvre, general manager of General Motors of Canada, Ltd., that contract for erection of the new addition of the Oshawa plant has been awarded to the W. H. Yates Construction Company of Toronto. The new building will be a one-story structure with a monitor type roof, brick walls, 690 feet in length and 90 feet in width and steel sashes for doors and windows, the cost of building to be in the neighborhood of \$200,000. Construction is to start at once and will be completed shortly after the first of September. The new structure when completed will be used for the manufacturing and assembling of the Pontiac car, which is at present being imported.

## New Type Deck Covering

NEW YORK, Aug. 7.—A new type of deck covering for closed cars is now in production in the Fairfield rubber plant of the E. I. Du Pont De Nemours & Co., which will be marketed under the trade

name of Du Pont Everbright Pontop.

The product is being manufactured to meet the demand for more moderately priced rubber top material which will have a greater permanency of finish than the coverings of this type previously offered.

The Du Pont company will continue to manufacture its Pyroxylin deck coverings. One of the chief virtues of the new material is the ease with which it can be worked under all climatic conditions. It will not crack in cold weather and being of a vulcanized rubber composition is unaffected by temperature or moisture.

## Numbers for Models

PHILADELPHIA, Aug. 7.—According to advertisements the 1927 Buick models are no longer designated as "Standard Six" and "Master Six." The former Master six model is now designated as model 115, while the 120 in. wheelbase Master six is designated as model 120 and the 128 in. wheelbase model on the same chassis as model 128.

## More Buildings Planned

DETROIT, Aug. 7.—General Motors Corp., besides utilizing the plant of the Flint Motor Co. for the manufacture of Fisher enclosed bodies for Buick cars, will also erect additional buildings for the production of woodwork and sheet-metal stampings, according to Harry H. Bassatt, president and general manager of the Buick Motor Co.

The price paid by General Motors for the Flint plant was \$3,762,000, while sale of some additional machinery and equipment is expected to boost this figure to \$4,000,000.

## Sides Going Abroad

DETROIT, Aug. 9.—Fred B. Sides, export manager of the Hupp Motor Car Corp., will be among the prominent motor car executives attending the Paris and London Motor Shows, this year. He sails Aug. 14 and will visit Hupmobile dealer organizations in Europe, closing his trip with big dealer meetings during the two big exhibitions.

## Big Dealer Shipments

TORONTO, Ont., Aug. 7.—Shipments of cars and trucks from the Toronto factory of Dodge Brothers (Canada), Ltd., to Canadian points for the first six months of 1926 show an increase of 81 per cent over the same period of last year, and a gain of 36 per cent over the entire year of 1925. Shipments for June alone show an increase of 166 per cent over June, 1925.

## Make 100,000 Trunks Yearly

JACKSON, Aug. 7.—The Potter Manufacturing Co., which produces Potter All-Steel Auto Trunks, recently shipped a carload of trunks to Seattle, Wash. The Company reports it is producing 100,000 trunks a year.

## Fairly Heavy Output at Plants with New Models

## Fall's Normal Increase Over Dull Months Should Make for Record Year

NEW YORK, Aug. 9.—The automobile manufacturers that recently brought out lines of new models are swinging into fairly heavy production and the industry as a whole is well above the average of mid-summer activity. All reports tend to indicate that the new cars are being received with the expected degree of enthusiasm, while most of the companies that follow the policy of no yearly models are continuing on satisfactory basis.

The summer is passing without the heavy slump in sales that was predicted several months ago by those of a pessimistic turn of mind. The manner in which the market has held up throughout the year has been a source of satisfaction to everyone connected with the industry, for it has been without precedent. It is customary, furthermore, for the fall months to show a material sales increase over the summer, and if this normal course is followed the year will indeed be by far the best the industry has ever seen.

There are one or two factors that are slightly different this year. Stocks in the hands of retailers to all indications are somewhat above normal and while this will not directly affect the market it may influence fall manufacturing. Again the manufacture and sale of closed cars has been proceeding at record breaking rate, almost without the usual swing to open cars in the warm weather, and it remains to be seen whether the fall business will be affected by this concentration on the all season model running to over eighty per cent for all manufacturers except Ford.

## New Plant for Heaters

INDIANAPOLIS, Aug. 7.—Increased business has caused the Indianapolis Pump and Tube Co. to provide a new plant at Columbus, Ind., for the manufacture of Arvin automobile heaters. Heretofore Arvin heaters were manufactured in the same plant with automobile jacks, but increase of business in both branches overtaxed that factory. Jack production now takes up the entire capacity of the factory formerly given over to both products.

## Memometer Company Moves

DALLAS, Texas, Aug. 7.—The J. F. Memometer Manufacturing company, a concern making a number of automobile accessories, will move its factory from Sherman to Dallas immediately.



# More Promising Conditions Present Bright Business Outlook for Trade

(Continued from page 37)

during the month which undoubtedly tended to restrict sales of certain lines.

Business conditions as a whole are good. Factories are working with increased forces and payrolls have been larger than during June. The depression is gradually passing and this fact is helping both the sale of new and used cars.

One of the best features of business in Columbus territory is the unusually large wheat crop which has been harvested, together with the high prices received for the wheat. As a result farmers are more inclined to buy automobiles. Crop prospects, following a soaking rain, which relieved the drought are excellent. Used cars are selling better. The stock of used cars is now normal and in some cases below normal.

Truck sales have been rather good and the truck outlook is good.

Sales of parts and accessories have been steady and are in excess of July of last year by about 20 per cent.

## Buffalo

The trend of business during the first part of July was quiet but after tenth of month there was a decided upturn.

Passenger car sales continued throughout July to be somewhat better than during the same month last year although the exact percentage of increase is not yet known. While sales are not as brisk as earlier in the year business continues good for the season and the bad slump expected by some has not materialized.

The used car situation remains unchanged. Most dealers characterize it as being about the same as a year ago which in view of the increased ratio of new car sales means there is difficulty in keeping used cars moving at the same rate as new ones.

Automotive equipment jobbers and wholesalers report a July better than last year, particularly the last half of the month.

Truck business is ahead of last year and the demand for the three-quarter and one ton sizes is particularly active. There has also been some activity among the very large sizes, particularly three ton.

Automobile and automotive equipment manufacturers report activity in tune with that during the earlier part of the year.

Lower prices somewhat stimulated tire business, otherwise tire sales are normal.

## Boston

Motor car sales during July were somewhat uneven but the general average for the month was good. During the early part of the month sales went along evenly then began to drop off. They picked up again for a time and then started to taper off as August was approaching. Yet on the whole the dealers,

with a few exceptions, reported that they were satisfied with business. Some of them stated that it seemed noticeable that when advertising was running heavily orders kept coming in somewhat steadily. They expected that there would be a drop in sales due to the sales resistance that crops up when new models are about to be announced.

Sales of used cars went along much better than had been anticipated. The dealers have been concentrating more on getting rid of the used cars, and some of them have stopped trading or put a limit on what they would absorb. Several of the dealers were surprised to find that during the excessive hot spell many people seemed to feel that used cars were needed to get out of the city, and so the sales went up.

Truck sales have been rather steady during the month. Distributors say that while general business is not as normal as it should be there have been enough new avenues opened and replacements have been frequent here and there to keep their orders going along rather regularly.

Outside of Boston reports to distributors of cars show that sales are much better than they were a month ago.

## Dallas

All lines of the automotive trade went into the eighth month of the year hitting on all cylinders. With the exception of electrical lines and heavy shop equipment, the sales in all departments during July showed a good increase over June and were increasing the first week in August.

The marketing of a \$50,000,000 grain crop, a \$20,000,000 fruit and vegetable crop and a \$2,000,000 melon crop, coupled with the continued improvement in the cotton crop situation, stimulated business. Rural districts were buying more automobiles of the low and medium price varieties while cities and towns were taking the usual numbers. The farming belts were buying more trucks and tractors also. The tire trade improved in the rural districts as did the accessory business.

But few dealers were overstocked in any lines. A rather general improvement in the tire business was due to lower prices, trade-in and part-pay policies. The tendency in Texas and parts of adjoining states is toward chain stores for tire dealers.

Some of the new models of automobiles have made appearance and are meeting with much favor. Collections are good.

Automobile dealers in Texas believe the number of sales, new and used cars, this year will exceed that of 1925 by ten or twelve per cent. The increase in South and Southwest Texas will be considerably greater than that.

## Business Conditions

Department of Commerce Gives  
View of Current Situation

WASHINGTON, Aug. 7.—Following is the weekly statement on business conditions issued today by the Department of Commerce.

"Business during the last week of July, as seen from check payments, was more active than a year ago, with the total for July also showing an increase over the same month of last year. Building contracts awarded during the last week of the month were larger than in either the preceding week or the same week of last year, while for the month as a whole larger awards are indicated than during the same month of 1925. Carloadings during the third week of the month were larger than in either the previous week or a year ago, while the output of crude petroleum during the last week continued to show increases over the previous weeks, the daily average output registering an increase over a year ago for the first time this year. The production of bituminous coal during the third week was larger than in either the previous week or the corresponding week of 1925, while the production of beehive coke, although larger than a year ago, was smaller than in the preceding week. The production of lumber during the third week was smaller than during either the previous week or the same week of last year.

"Wholesale prices continued to decline, the average for the last week of the month being lower than at any time since September, 1924. Loans and discounts of Federal reserve member banks were smaller at the end of July than at any time during the month but were larger than a year ago. Interest rates on call money averaged higher during the last week than in either the previous week or the same week of last year, with time-money rates showing corresponding increases. Prices of stocks on the New York Stock Exchange continued to average higher both as compared with the preceding week and the corresponding week of the past year. Business failures were more numerous than in the third week and a year ago, the total for weeks in July being smaller, however, than in the same period of 1925."

## Many Talk Merchandising

DUBUQUE, Iowa, Aug. 7.—Several hundred automotive dealers from northwestern Iowa attended a merchandising meeting and picnic held here Aug. 2 under the auspices of Heeb Jobbers. At the merchandising meeting an address was made by Henry T. Kirkland, special merchandising representative of the Automotive Equipment Association. Other talks were made by A. A. Heeb and Harlan G. Melchior, mayor of Dubuque.

## Rolls-Royce Branch in Texas

HOUSTON, Texas, Aug. 7.—The first direct factory branch of the Rolls-Royce Company of America to be located in the South, has been established here.

## European Grand Prix Is Won by Goux in Bugatti

### Delage Drivers Disqualified Following Complaints Involving Rules

SAN SEBASTIAN, Spain, July 19—(By Mail)—Neglect to sufficiently consider the comfort of the driver caused Delage to lose the European Grand Prix 500 mile road race held here yesterday and has provoked a squabble which will be carried up to the International Sporting Commission for solution.

The race, which ranks as the most important in Europe, was won by Jules Goux, driving a supercharged 91½ in. straight eight Bugatti, at an average speed of 70.5 miles an hour. Bourlier on the new straight eight supercharged Delage came in second, eight minutes behind the winner; Costantini on Bugatti was third, 37 minutes after the winner; Robert Benoist on Delage and Minoia on Bugatti were stopped after having covered 41 of the 45 laps, the former then having a lead of 26 seconds, and Louis Wagner on Delage was stopped after 34 laps, during which he set up the lap record at 81.7 miles an hour.

Claiming that unauthorized relief drivers had handled the Delage cars, a protest was lodged by Bugatti during the race, with the result that 12 hours later Bourlier and Benoist were disqualified, Wagner was not given credit for his record lap, and Minoia was also disqualified. Delage has filed an appeal on the ground that the relief drivers had been approved by the umpire and states that he will bring the case before the International Racing Board. Meanwhile the official ruling gives Bugatti first and second places, with Delage third and transfers credit for the record lap to Costantini.

The European Grand Prix, which each year changes country, was entrusted to the Spanish automobile club, which spent two million pesetas in preparing an excellent 10¼-mile road circuit close to San Sebastian, and offered 130,000 pesetas in cash prizes. Owing to an eleventh hour accident the new Talbots could not start and the two-stroke Sima-Violets were not ready. This reduced the field to three Bugattis and three Delages, the race constituting the first encounter of the 1926 European 91½ in. models.

### Sign for Auburn Sales

SPOKANT, Wash., Aug. 7.—A. J. Davidson and W. F. Davidson, doing business under the firm name for the Consolidated Auto Company, have taken over the wholesale agency for the Auburn car in this territory and the retail agency for the city. Auburn has not been represented here for a number of years. The Davidsons have been in the automobile business here for many years and for a long time handled the Apperson car.

## NEW Automotive Literature

**STOCK CONTROL AND ACCOUNTING IN PARTS BUSINESS.** The full title of this book is Manual of Standardized Practice of Accounting, Bookkeeping and Stock Control, and their Relation to Business Administration. It has been compiled especially for the parts business by Robert MacFee, secretary to the Merchandising and Standardization Committee of the National Standard Parts Association. The book deals with fundamental principles of business administration and gives forms for use in accounting and bookkeeping. The book is bound in heavy paper and has about 125 pages. It is published by the National Standard Parts Association, Detroit, Mich.

**AUTOMOBILE SALESMANSHIP.** A course in automobile salesmanship by the project method of teaching has been prepared by Clyde Jennings, formerly editor of MOTOR AGE, and published by the International Textbook Co., Scranton, Pa. The course is in four parts and a list of examination questions is included with each part. The first part is devoted to the general subject of preparing for automobile selling. The second part shows the salesman the importance of knowing the car he sells and competing cars, and how he may best acquire a complete knowledge of these cars. In the third part the subject of proper demonstration is covered. The fourth part tells how the dealer can help his salesmen. The course is distributed by the International Correspondence Schools.

**HOW TO DISPLAY MERCHANDISE TO SELL IT.** This booklet by William Nelson Taft, editor of Retail Ledger, discusses the different methods of showing automotive merchandise in such a way as to attract buyer. A great deal of attention is given to the storefront, and doors and windows. Effective use of show windows is discussed. The booklet is published and distributed free by the Kawneer Co., Niles, Mich.

**PUROX CATALOG, No. 6** has been issued by the Purox Company, Denver, Colo. This is a complete descriptive book of all the welding and cutting apparatus manufactured by the Purox Company.

## Bugatti to Be Sold in United States by Stutz

### Molsheim Maker at Same Time to Market Indianapolis Car in France

PARIS, July 24.—(By Mail)—Bugatti cars are to be marketed in the United States by the Stutz Motor Car Company of America, Inc., and Stutz cars will be sold in France by the Bugatti Company, according to a statement made by F. E. Moscovics, president of the Stutz Company who is at present in this city. Bugatti, whose works are at Molsheim, near Strasbourg, specializes in a straight eight 122 in. sporting type chassis sold in France at \$2,000. A pure racing type car, similar to the normal model in external appearance, but having a built-up roller bearing crankshaft, is also marketed. A very costly straight eight with a piston displacement of 898 cu. in. is also being prepared, but is not yet on the market.

To assist sales in the United States, Ettore Bugatti states that he will race extensively on American tracks next year, opening his campaign with six cars, handled by American drivers, in the Indianapolis race.

The first Stutz chassis to be seen in France is now at the Weymann body works, being fitted with a special low-built fabric leather body.

### Buy Oldest Seattle Agency

SEATTLE, Wash., Aug. 7.—Purchase of the Seattle Automobile Company, oldest motor car firm in Seattle by three widely known automobile men of this city has been announced. The new owners are Sherman Bishnell, general manager; H. W. Harbaugh, treasurer, and Allan P. Lacy, sales manager. W. J. Campbell has been appointed service manager.

H. P. Grant founded the Seattle Automobile Company in 1903 and until the recent change retained charge of the business.



European Grand Prix as seen from timer's platform



# TRADE ASSOCIATION ACTIVITIES

## CONDUCT LECTURE SERIES

### Technical Subjects Discussed Before Accessory and Service Men

ST. LOUIS, Mo., Aug. 9.—A series of meetings has been arranged by the Associated Automobile Service Companies of St. Louis for automobile service company representatives, accessory dealers and their salesmen at which lectures on technical automobile subjects will be given. The Automotive Accessory Association of St. Louis is co-operating.

There were about 150 present at the first meeting held recently at which Ray Small, engineer with the Indiana Piston Ring Co., Hagerstown, Ind., maker of the Perfect Circle Piston Ring was the speaker.

Albert L. Jageman, president of the A. A. S. C. of St. Louis, presided. George Niekamp, president of the A. A. A. of St. Louis was present.

### Credit Group Formed

NEW YORK, Aug. 7.—Manufacturers of replacement parts have organized an independent group for the study of credit experiences and will meet monthly, with some sessions in the middle west and others in New York. The organization was named "Group R. P." at its initial meeting in Buffalo, and has 16 charter members. A. H. Fagan, manager of the Credit Department of the Motor & Accessory Manufacturers Association, which conducts similar groups of parts, accessory and service equipment manufacturers, selling in some cases for original equipment and in other cases to the trade, was elected secretary.

### Oppose Compulsory Insurance

WASHINGTON, Aug. 7.—Opposition to compulsory automobile insurance, legislation for which is pending in several state legislatures and Congress, was voiced here this week by the American

Automobile Association. The association announces its stand on the subject after an investigation extending over several years, it declares.

Five major reasons are assigned why compulsory insurance is not desirable, viz: (1) It would cost the motorist \$300,000,000 annually to provide protection against a comparatively few motorists, who are financially irresponsible; (2) would increase insurance rates; (3) would breed recklessness rather than promote greater care; (4) would degenerate into state insurance and be an entering wedge for state control of every other business, and (5) would not prove a safety factor as "there is no relation between prevention of accidents and compensation for accidents."

The association announces its intention of carrying on an active campaign against compulsory legislation in every legislature where bills are introduced and in Congress.

### Report on Tire Survey

NEW YORK, Aug. 7.—The average number of all types of pneumatic casings in the hands of tire dealers on July 1, 1926, was 478 against 609 on April 1 and 614 on July 1, 1925, according to the survey just completed by the National Tire Dealers Association. Tube inventories were also lower July 1, average being 852 per dealer, against 1,077 on April 1 and 1,069 a year ago.

Reports were received from members in 30 cities with the majority reporting only one line of tires carried. Most of those replying to the questionnaire said that uncertainty of prices retarded sales and reported increased demand for repairing tires. A small majority reported increased sales for the first half of the year of 1926 over the same period of 1925.

## DEALERS HEAR GOVERNOR

### Oregon's Chief Executive Also Leads Grand March at Outing

PORTLAND, Ore., Aug. 9.—The 12th Annual Picnic of Portland Automotive Trades Association was held at Crystal Lake Park. More than 1,000 people participated in the annual jollification and the prizes in 30 events totaled over \$1,000 in cash and merchandise.

Governor Pierce led the grand march and made a brief talk to the dealers and their families. Credit for the unusually successful event is due to President George L. Sammis of the Sunset Electric Company.

### Make Service Pin Awards

CLEVELAND, Ohio, Aug. 7.—Unusual awards for factory men were announced at the annual meeting of the Service Pin Association of the Goodyear Tire & Rubber Company, held in Goodyear Hall here. Six thousand, who have been members of the association five years or more, attended.

Workmen who have accomplished exceptional results during the year will be given gold medals and their names inscribed on a bronze honor roll. Other awards will be made as circumstances justify to those conspicuous in the saving of life, prevention of accidents, damage or loss, advancement of better relationship between company and men, and in the development of methods or products beneficial to the rubber industry as a whole.

The Service Pin Association was founded in 1915 when President Litchfield, then vice-president in charge of production, made a gift of \$100,000 to Goodyear employees, representing his accumulated salary since he joined Goodyear in 1901. Approximately \$120,000 in dividends has been paid to employees.

## Big Time at Washington Dealers' Outing



WASHINGTON, Aug. 7.—The Washington Automotive Trade Association, comprising 125 wholesalers and dealers, held its annual outing this year at Log Inn on the Chesapeake Bay, 40 miles from here. Stanley Horner, Buick distributor, was in charge of the outing, assisted by a committee composed of L. S. Jullian, Rudolph Jose, Fred Haller, Neil Walcott, and Si Grogan.

J. Kurtz of the Washington-Cadillac Company was high point winner in the contest for the Washington-Cadillac cup, a trophy offered by this company for permanent possession to the individual who wins it three times. Winners of the various events were: 50 yard dash—F. Houser, J. Kurtz, E. Collins; running broad jump—W. Prince, E. Collins, B. Jones; standing broad jump—F. Houser, E. Adams, M. De Bruin; shotput—J. Kurtz, E. Adams, J. Fuller; potato race—J. Kurtz, J. Fuller, E. Fisher; nail drive—J. Fuller, W. Woods, J. Kurtz, L. S. Jullien. Superintendent of Police Edwin B. Hesse, Director of Traffic M. O. Eldridge and Col. I. H. Miller, assistant director of traffic, were guests.

## Engine Changes and New Colors in 1927 Chevrolet

### Connecting Rods Are Lighter, Cams Redesigned and Engine Has Stronger Support

DETROIT, Aug. 10.—More colorful bodies and several minor mechanical changes are embodied in the new 1927 series of cars announced this week as the "Smoothest Chevrolet." While no changes have been made in the body lines, the 1927 cars have a striking appearance, due to the harmonious blending of the new Duco colors. Prices remain unchanged.

The outstanding mechanical feature of the new Chevrolets is the adoption of an additional engine support bolted between the clutch and transmission housing. This channel member, formed of pressed steel, is attached to gusset plates on the frame side members by two bolts on each side, and this arrangement permits of easy removal of the entire power plant when desired. The object of this unit is to absorb torque reaction on the propeller shaft, which in turn reduces vibration and provides a more substantial support for the power plant and strengthens the chassis frame. Along with this change the universal joints have been redesigned so that the trunnions operate on separate bushings, making for longer life and easier service.

Two changes have been made on the engine. The connecting rods have been lightened by changing the "I" section slightly, and the cams have been rounded off to get a quieting curve effect. The spark and throttle controls, formerly mounted on the instrument board, are now carried in the center of the steering wheel, along with the horn button, and this change has necessitated a redesigning of the steering gear and the layout of the throttle controls.

A new feature is the method of operating the stop light on the new cars. In place of the customary wire spring and switch, the light is operated by a lug on the brake rod which comes in contact with a lever suspended from the fourth frame member. The lever is integral with the switch, the latter being of the non-arcing variety.

A solid rubber battery case with the handles built into the case and a new method of securing the battery to the frame are employed on the new series. Instead of pull-down bolts, a horizontal bolt clamps the two sides of the battery container to the side of the battery, thereby making a more rigid mounting.

Colors on the new bodies are: Sedan, Algerian blue; Coach, Thebes gray; landau, Alpine green; coupe, Dundee gray; with the open models finished in Biscay green. All cars now have a rear view mirror as standard equipment. Both the landau and sedan are equipped with disc wheels with the wooden wheels on the coach and open models finished in Duco. Balloon tires are standard equipment on all closed cars.

## Coming Motor Events

### Automobile Shows

#### 1927 NATIONAL SHOWS

New York.....Jan. 8-15  
Chicago.....Jan. 29-Feb. 5

Boston, Mass.....March 5-12  
Mechanics Bldg.

Boston, Mass.....Sept. 27-Oct. 2  
Radio Exposition, Mechanics' Bldg.

Chicago.....Nov. 8-13  
Show and convention, Automotive Equipment Ass'n, Coliseum.

Chicago.....Nov. 15-19  
Show and convention of the National Standard Parts Ass'n, Hotel Sherman.

Chicago.....Sept. 27-Oct. 2  
National Radio Exposition.

Dallas, Tex.....Oct. 9-24  
Automobile Bldg.

New York.....Sept. 13-18  
Madison Square Garden, Radio World's Fair.

San Francisco.....Aug. 21-28  
Pacific Radio Exposition, Exposition Auditorium.

St. Louis.....Sept. 4-19  
Industrial Exposition, Forest Park.

### Races

Altoona, Pennsylvania.....Sept. 6  
Atlantic City, N. J.....Sept. 25  
Charlotte, N. C.....Aug. 23  
Dallas, Texas.....Nov. 11  
Los Angeles, Cal.....Nov. 25  
Philadelphia.....Sept. 4-11

National Air Races

Salem, New Hampshire.....Oct. 12

### Conventions

Automotive Equipment Association, Coliseum, Chicago.....Nov. 8-13

National Standard Parts Association, Hotel Sherman, Chicago.....Nov. 15-19

National Tire Dealers Association, Inc., Memphis, Tenn.....Nov. 16-18

Pennsylvania Automotive Association Elks' Home, Philadelphia.....Oct. 18-19

Society of Automotive Engineers, Transportation and Service Meeting, Boston, Mass.....Nov. 16-18

### COMING FEATURE ISSUE OF CHILTON CLASS JOURNAL PUBLICATIONS

September 15—Commercial Car Journal—Annual Bus Issue

September 30—Automotive Industries—Annual Production Issue

### New Dodge Brothers Roadster

DETROIT, Aug. 10.—A new sport roadster with rumble seat, listing at \$945, has been added to the Dodge Brothers line. This is the third roadster in regular production in this line.

### Four-Day Nash Outing

LOS ANGELES, Aug. 7.—One of the largest and most novel and very likely the longest dealer outing ever held in the West was staged in the middle of July by the Troy Motor Sales Company, Nash distributors for Southern California and Arizona, for Nash dealers throughout the territory. The outing, which was enjoyed by nearly 100 Nash dealers, lasted four days, and was held in some of the finest fishing and hunting grounds in the Southland.

### Branch for Rickenbacker

ST. LOUIS, Mo., Aug. 7.—A factory branch has been organized to handle the Rickenbacker car in St. Louis, the former distributor, the St. Louis Rickenbacker Co. having retired from the business. The branch occupies the building at 2218 Locust Street, formerly occupied by the St. Louis Rickenbacker Co.

Sam C. Mitchell, who was sales manager for the former distributor, has been appointed branch manager and most of the other officials and employees remain.

F. N. Morgan, district sales manager for the Rickenbacker Motor Co. organized the branch.

### More Flint Franchises

LOS ANGELES, Aug. 7.—Since the recent appointment of the Perkins Motor Company as Southern California distributors of the Flint, there has been a substantial expansion in the Flint dealer organization in this territory. C. H. Anderson, manager of the distributing company, reports the following appointments: Pacific Motors, associate dealers, Los Angeles; Hollywood Flint Company, Hollywood; Keating & Cunningham, Culver City; J. W. Crawford, Alhambra; Cotterman & Mann, Pasadena; Cronenweth Auto Sales Company, Glendale.

### Canadian Exports

TORONTO, Aug. 7.—Exports of automobiles from Canada totaled 2,979 in June, against 3,977 in May, and 4,811 in June, 1925. For the 12 months ended June, 1926, the total was 56,912 automobiles, against 48,392 for the corresponding period of 1924-25.

Trucks exports in June were 1,562, against 1,617 in May, and 1,270 in June, 1925. For the 12 months ended June, 1926, the total was 20,319, compared with 12,706.

### Record Sales in Dominion

MONTREAL, Can., Aug. 7.—The automobile industry in Canada is showing a most remarkable record which is understood to be due to the lowered tariff with the United States. Sales to date have exceeded those of any previous 12 months.



# Prices and Weights of Current Passenger Car Models

SHIP  
WT. PASS. BODY STYLE. PRICE

<b>AUBURN "4-44"</b>			
.....	5-p	Touring	\$1,145
.....	5-p	Roadster	1,145
.....	5-p	Coupe	1,175
.....	5-p	Sedan	1,195

<b>"6-66"</b>			
2850	4-p	Sport-Roadster	1,395
2860	6-p	Touring	1,395
.....	3-p	Coupe	1,445
3020	5-p	Brougham	1,495
3070	5-p	Sedan	1,695
3070	.....	Wanderer	1,745

<b>"8-88"</b>			
(129 in. W. B.)			
1810	4-p	Sport-Roadster	1,695
3200	6-p	Touring	1,695
.....	3-p	Coupe	1,745
3380	5-p	Brougham	1,795
3450	5-p	Sedan	1,995
3450	.....	Wanderer	2,045

<b>"146 in. W. B.)"</b>			
.....	7-p	Sedan	2,495

<b>BUICK</b>			
<b>"115"</b>			
2845	2-4-p	Roadster	\$1,195
2955	5-p	Touring	1,225
3020	2-4-p	Coupe	1,195
3150	5-p	2 d. Sedan	1,195
3110	4-p	Coupe	1,275
3230	5-p	4 d. Sedan	1,295

<b>"120"</b>			
(120 in. W. B.)			
.....	4-p	Coupe	1,465
3670	5-p	2-d. Sedan	1,395
3765	5-p	4-d. Sedan	1,495

<b>"128"</b>			
(128 in. W. B.)			
3570	4-p	Sp. Roadster	\$1,495
3635	5-p	Sp. Touring	1,525
3805	3-p	Country Club	1,765
.....	5-p	Coupe	1,850
3940	5-p	Brough. Sedan	1,925
4025	7-p	Sedan	1,995

<b>CADILLAC</b>			
<b>"314" Standard Line</b>			
(132 in. W. B.)			
4110	5-p	Brougham	\$2,995
4040	2-p	Coupe	3,100
4125	4-p	Victoria	3,195
4210	5-p	Sedan	3,250
4315	7-p	Sedan	3,550
.....	2-p	Sport Coupe	3,500
4380	7-p	Imperial	3,535
.....	.....	Sport Sedan	3,650

<b>Custom Built</b>			
(132 in.)			
4065	2-p	Roadster	\$3,350

<b>(138 in. W. B.)</b>			
4125	7-p	Touring	\$3,450
4109	5-p	Phaeton	3,450
.....	.....	Sp. Phaeton	3,975
.....	.....	Conv't Coupe	3,450
4300	5-p	Coupe	3,855
4300	5-p	Sedan	3,995
4400	7-p	Suburban	4,125
4450	7-p	Imperial	4,350

<b>CASE</b>			
<b>J. I. C.</b>			
3260	3-p	Roadster	\$1,840
3290	5-p	Touring	1,885
3470	5-p	Sp. Touring	2,160
3640	5-p	Sedan	2,590
3650	5-p	Brougham	2,590

<b>"Y"</b>			
3950	7-p	Touring	2,225
4320	7-p	Sedan	2,975

<b>CHANDLER BIG SIX</b>			
.....	2-4-p	Roadster	\$1,695
.....	5-p	Sport Touring	1,545
.....	7-p	Touring	1,645
.....	5-p	20th C'y Sedan	1,495
.....	5-p	Met. Sedan	1,595
.....	4-p	Coupe	1,675
.....	7-p	Sedan	1,795

<b>CHEVROLET "X"</b>			
1780	2-p	Roadster	\$510
1875	5-p	Touring	510
2030	2-p	Utility Coupe	645
2130	5-p	Coach	645
2215	5-p	Sedan	735
2215	5-p	Landau Sedan	765

<b>CHRYSLER</b>			
<b>"60"</b>			
2575	5-p	Touring	\$1,075
2545	5-p	Roadster	1,145
.....	2-p	Coupe	1,165
2780	5-p	Coach	1,195
2840	5-p	Sedan	1,295

<b>"70"</b>			
2805	4-p	Roadster	\$1,525
2785	5-p	Phaeton	1,395
2895	5-p	Coach	1,395

SHIP  
WT. PASS. BODY STYLE. PRICE

<b>CHRYSLER (Continued)</b>			
3060	5-p	Sedan	1,545
2935	4-p	Royal Coupe	1,695
2995	5-p	Brougham	1,745
3085	5-p	Royal Sedan	1,795
3090	5-p	Crown Sedan	1,895

<b>"80"</b>			
(185½ in. *)			
3775	5-p	Phaeton	2,545
3730	2-4-p	Roadster	2,595
4105	5-p	Sedan	3,095
(192½ in. *)			
4015	4-p	Coupe	2,895
(198½ in. *)			
4225	7-p	Sedan	3,195
4260	7-p	Sedan Lim.	3,595

<b>CLEVELAND "31"</b>			
2415	5-p	Touring	\$945
2565	5-p	Tour'g DeLuxe	1,025
2520	3-p	Coupe	1,035
2695	5-p	Sedan	1,090

<b>"43"</b>			
2800	5-p	Touring	1,145
2975	5-p	Sp. Touring	1,295
2915	3-p	Coupe	1,225
3145	5-p	Sedan	1,345

<b>CUNNINGHAM</b>			
<b>"V-6"</b>			
4500	4-p	Sp. Touring	\$6,150
4600	7-p	Touring	6,650
4700	4-p	Coupe	7,600
5000	6-p	Limousine	8,100

<b>DAGMAR</b>			
<b>"6-70"</b>			
3750	4-p	Roadster	\$3,500
3800	4-p	Sp. Tourer	3,500
3700	4-p	Phaeton	3,500
4200	4-p	Petite Coupe	4,500
4200	4-p	Petite Sedan	4,500
4500	4-p	De Luxe Coupe	4,750
4700	5-p	Sedan	4,700
4800	7-p	Sedan	4,750

<b>"6-60"</b>			
3150	5-p	Touring	1,785
3100	2-p	Roadster	1,985
3200	4-p	Sp. Touring	1,985
3500	5-p	Sedan	2,445

<b>DAVIS</b>			
<b>"92-27"</b>			
2915	5-p	Legion. Tour.	1,495
3000	5-p	Sedan	1,595
3060	5-p	Imperial Sedan	1,795

<b>"93-27"</b>			
2325	5-p	Touring	\$1,285
2500	5-p	Sedan	1,285
2450	3-p	Coupe	1,285

<b>DIANA "St. 8"</b>			
2995	5-p	Roadster	\$1,795
2995	5-p	Palm Beach	1,995
3170	5-p	DeL. Brougham	1,995
3275	5-p	De Luxe Sedan	2,195
3160	5-p	Cabriolet	2,095
3640	7-p	Sedan (135 in W. B.)	2,695
3640	7-p	Berline Sedan	2,895
.....	5-p	Town Car.	.....

<b>DODGE BROTHERS</b>			
2448	2-p	Roadster	\$ 795
2538	2-p	Special Roadster	845
2567	5-p	Touring	795
2642	5-p	Spec. Touring	845
2497	2-p	Sport Roadster	880
2617	4-p	Sport Touring	880
2589	2-p	Coupe	845
2632	2-p	Spec. Coupe	895
2811	5-p	Sedan	895
2883	5-p	Spec. Sed.	945
2920	5-p	DeL. Sedan	1,075

<b>DUESENBERG</b>			
<b>Straight "3"</b>			
3920	2-p	Roadster	↑
3970	4-p	Roadster	↑
3700	5-p	Phaeton	↑
3980	4-p	Sp. Phaeton	↑
4115	5-p	Sedan	↑
4500	7-p	Sedan	↑

↑Manufacturers do not quote list prices.

<b>DU PONT</b>			
3300	2-p	Roadster	\$2,600
3550	5-p	Touring	2,600
3800	7-p	Touring	2,750
3550	5-p	Touring Sedan	3,400

<b>DURANT</b>			
<b>A-22</b>			
2300	5-p	Touring	\$ 730
2380	5-p	Spec. Touring	805
2450	4-p	Coupe	825
2480	4-p	Spec. Coupe	875
2650	5-p	Sedan	835
3710	5-p	Spec. Sedan	995

SHIP  
WT. PASS. BODY STYLE. PRICE

<b>ELCAR</b>			
<b>"4-55"</b>			
2560	5-p	Touring	\$1,095
.....	4-p	Roadster	1,295
2900	5-p	Coach	1,195
.....	3-p	Coupe	1,295
2779	5-p	Sedan	1,395

<b>"6-65"</b>			
.....	5-p	Touring	1,295
.....	4-p	Roadster	1,495
.....	3-5-p	Landau R'dster	1,675
2779	5-p	Coach	1,395
.....	3-p	Coupe	1,495
2900	5-p	Sedan	1,595

<b>"8-81"</b>			
.....	7-p	Touring	2,965
3000	3-p	Coupe Rdster.	2,195
.....	3-5-p	Landau R'ster	2,295
.....	4-p	Coupe	2,095
.....	5-p	Sedan	2,265
4050	7-p	Sedan	2,765

<b>ESSEX</b>			
2290	5-p	Touring	.....
2455	5-p	Coach	\$795

<b>FLINT</b>			
<b>"Z-18"</b>			
2497	5-p	Coach	1,085
2500	5-p	DeL. Coach	1,185

<b>"B-60"</b>			
2683	4-p	Roadster	1,395
2708	5-p	Touring	1,285
.....	4-p	Coupe Roadster	1,495
3093	5-p	Sedan 4d.	1,525
2933	5-p	Brougham	1,525

<b>"E-80"</b>			
(120 in. W. B.)			
3139	4-p	Sport Road.	\$1,945
3189	5-p	Touring	1,595
3310	4-p	Sp. Touring	1,945
3414	4-p	Coupe	2,045
3529	5-p	Sedan	2,195

<b>(130 in. W. B.)</b>			
3294	7-p	Touring	.....
3649	7-p	Sedan	2,395

<b>FORD</b>			
<b>With Starter, Dem. Rims and Balloon Tires</b>			
1655	2-p	Runabout	\$360
1738	5-p	Touring	380
1860	2-p	Coupe	485
1972	5-p	Tudor Sedan	495
2004	5-p	Fordor Sedan	545

FRANKLIN			
"11"			
2800	3-p	Sport Road.	\$2.6
2845	5-p	Touring	2.6
2965	3-p	Coupe	2.6
.....	3-5-p	Coupe	2.7
3175	5-p	Sedan	2.7
.....	4-p	Victoria	2.7
.....	5-7-p	Sedan	2.8
.....	5-p	Oxford Sedan	2.8
3080	5-p	Sport Sedan	2.8
3275	7-p	Limousine	2.9
3135	7-p	Cabriolet	2.9

# Prices and Weights of Current Passenger Car Models

## SHIP WT. PASS. BODY STYLE. PRICE

MCFARLAN "SV"			
1700	2-p	Roadster	\$2,650
2000	2-p	Spec. Roadster	2,900
3600	5-p	Touring	2,650
3850	5-p	Touring	2,750
3850	5-p	Brougham 4d.	3,180
3850	5-p	Coupe	3,180
3850	5-p	Spec. Sedan	3,180
3850	5-p	Sedan	3,280
3850	5-p	Sub. Sedan	3,380
3850	5-p	Sub. Sedan	3,480

"TV"			
4000	2-p	Roadster	\$5,400
4600	4-p	Sp. Touring	5,600
4900	4-p	Coupe	6,720
5200	4-p	Tour. Sedan	6,720
5200	7-p	Tour. Sedan	6,810
5200	7-p	Sedan	6,720
5200	7-p	Spec. Sedan	6,810
5200	7-p	Enc. Sedan	7,110
5200	7-p	Sub. Sedan	7,110
5200	7-p	Town Car	9,000

"Straight 8"			
2000	2-p	Roadster	\$2,650
2000	4-p	Roadster	2,900
2000	5-p	Touring	2,650
2000	7-p	Touring	2,750
2000	5-p	Sedan	3,180
2000	5-p	Sub. Sedan	3,380
2000	7-p	Sedan	3,280
2000	7-p	Sub. Sedan	3,480
2000	4-p	Coupe	3,180
2000	5-p	Coach Broug.	3,180
2000	5-p	Town Car	4,600

MARHON			
3913	4-p	Speedster	\$3,295
3827	2-p	Speedster	3,295
3604	5-p	Phaeton	3,295
3704	7-p	Touring	3,295
4080	5-p	Std. Brougham	3,295
3983	2-p	Std. Coupe	3,295
3937	4-p	Victoria	3,295
4065	5-p	Sedan	3,295
4243	7-p	Spec. Broug.	3,370
4080	5-p	Spec. Sedan	3,395
4065	5-p	Spec. Sedan	3,395
4243	7-p	Spec. Sedan	3,470
4031	5-p	Sedan De Luxe	3,775
4175	7-p	Sedan de Luxe	3,850
4100	5-p	Sedan Lim.	3,900
4216	7-p	Sedan Lim.	3,975

MOON			
2000	3-5p	Roadster	\$995
2000	5-p	Phaeton	995
2000	5-p	Coach	995

Series "A"			
2600	5-p	Roadster	\$1,395
2600	5-p	Roadster	1,395
2600	5-p	Touring	1,195
2720	5-p	Cab. Roadster	1,595
2710	5-p	DeL. Brougham	1,395
2860	5-p	DeL. Sedan 4d.	1,545

London			
3270	5-p	Sp. Touring	\$1,985
3290	7-p	Touring	1,985
3590	5-p	Petite Sedan	2,540

NASH			
2210	5-p	Touring	\$865
2410	5-p	Sedan	995

"Special"			
2870	2-p	Roadster	\$1,115
2960	5-p	Touring	1,135
2980	4-p	Roadster	1,225
3030	2-p	Business Coupe	1,165
3120	5-p	Sedan 2d.	1,215
3170	5-p	Sedan	1,315
3270	5-p	Sedan 4d.	1,445

"Advanced"			
(121 in. W. B.)			
3390	4-p	Roadster	\$1,475
3400	5-p	Touring	1,340
3550	5-p	Sedan 2d.	1,425
3650	5-p	Sedan	1,525

"Advanced"			
(127 in. W. B.)			
3480	7-p	Touring	\$1,490
3640	4-p	Victoria	1,790
3750	5-p	Coupe 4d.	1,990
3830	7-p	Sedan	2,090

OAKLAND			
"E"			
3600	4-p	Sp. Roadster	1,175
2500	5-p	Phaeton	1,025
2640	5-p	2d. Sedan	1,095
2615	3-p	Landau Coupe	1,125
2765	5-p	4d. Sedan	1,195
2885	5-p	Landau Sedan	1,295

OLDSMOBILE			
"30E"			
2220	5-p	Touring	\$875
2340	4-p	DeL. Roadster	975
2405	5-p	DeL. Touring	980
2350	2-p	Coupe	925

## SHIP WT. PASS. BODY STYLE. PRICE

2450	5-p	Coach	950
2470	2-p	De Luxe Coupe	990
2620	5-p	De Luxe Coach	1,050
2520	5-p	Sedan	1,025
2690	5-p	De Luxe Sedan	1,125
2700	5-p	Landau	1,190

OVERLAND			
"96" 4			
2075	5-p	Touring	\$645
2075	5-p	Coupe	735
2075	5-p	Sedan	735
"91" 4			
1919	5-p	Touring	\$495
2202	5-p	Std. Sedan 2d	595
"93" 6			
2395	5-p	Touring	\$895
2397	2-p	Coupe	895
2443	4-p	Std. Sedan	935

PACKARD			
"6"			
4-p	Roadster	\$2,685	
5-p	Phaeton	2,685	
4-p	Coupe	2,685	
5-p	Sedan	2,685	

(133 in. W. B.)			
7-p	Touring	\$2,785	
7-p	Sedan	2,785	
7-p	Club Sedan	2,725	
7-p	Sedan Lim.	2,885	

"8"			
(135 in. W. B.)			
4-p	Runabout	\$3,850	
5-p	Phaeton	3,750	
4-p	Coupe	4,750	
5-p	Sedan	4,750	

(143 in. W. B.)			
7-p	Touring	\$3,950	
5-p	Club Sedan	4,890	
7-p	Sedan	5,000	
7-p	Sedan Lim.	5,100	

PAIGE			
"6-72"			
(125 in. W. B.)			
3500	5-p	Std. Sedan	\$1,495
3615	5-p	Sedan De Luxe	1,670
3475	4-p	Cab Roadster	2,295
3740	7-p	Sedan DeLuxe	1,995
3825	7-p	Limousine	2,245
(115 in. W. B.)			
3055	5-p	Brougham	\$1,295

PEERLESS			
"6-72"			
(126½ in. W. B.)			
3175	5-p	Touring	\$1,895
3425	5-p	Coupe	2,295
3500	5-p	Sedan	2,395

(133½ in. W. B.)			
3275	2-p	Sp. Roadster	\$2,195
3300	7-p	Sp. Touring	1,995
3700	7-p	Sedan	2,595
3825	7-p	Limousine	2,695
3575	5-p	De Luxe Sedan	2,795
3650	7-p	De Luxe Sedan	2,995

"6-80"			
2800	5-p	Phaeton	\$1,395
2895	5-p	Roadster	1,495
2950	2-4-p	Coupe Roadster	1,565
3140	5-p	Sedan	1,495
3140	5-p	Std. Sedan	1,595
3140	5-p	Sport Sedan	1,795
3140	5-p	De Luxe Sedan	1,795

"8-69"			
3675	5-p	Roadster	\$2,995
3950	5-p	Sedan	3,495
4025	7-p	Sedan	3,595
4100	7-p	Ber. Limousine	3,795

PIERCE-ARROW			
"80"			
3245	2-p	Runabout	\$2,895
3300	4-p	Phaeton	3,095
3425	7-p	Phaeton	2,895
3470	5-p	Coach 2d.	2,995
3525	5-p	Coach 4d.	3,250
3620	7-p	Coach	3,350
3375	4-p	Coupe	3,695
3480	5-p	Sedan	3,895
3600	7-p	Sedan	3,995
3655	7-p	Enc. Dr. Lim.	4,045
3675	7-p	Lim. Coach	3,450

"33"			
4350	2-p	Runabout	\$5,250
4500	4-p	Touring	5,250
4590	7-p	Touring	5,250
4730	3-p	Coupe	6,800
4800	4-p	Sedan	6,900
4960	7-p	Sedan	7,000
4750	4-p	Coupe Sedan	6,900
4730	6-p	Brougham	6,800
4850	7-p	Limousine	7,000
5060	7-p	Enclosed Lim.	7,000
4780	7-p	French Lim	7,000
4730	6-p	Landaulet	7,000

PONTIAC			
2395	2-p	Coupe	\$825
2450	5-p	2d Sedan	825
5-p	Landau Sedan	895	

## SHIP WT. PASS. BODY STYLE. PRICE

REO			
"T-6"			
3375	2-p	Roadster	\$1,665
3382	5-p	Sp. Touring	1,395
3365	2-p	Coupe	1,495
3365	2-p	Spec. Coupe	1,565
3515	5-p	Sedan 4d.	1,565
3565	5-p	Spec. Sedan	1,745

REVERE			
"25"			
3900	2-p	Sp. Roadster	\$2,750
3975	4-p	Speedster	2,750
4050	5-p	Touring	2,750
4300	5-p	Sedan	3,800

"M"			
3700	2-p	Roadster	\$3,200
3800	4-p	Sportster	3,200
3970	5-p	Touring	3,200
4400	5-p	Sedan	4,000

RICKENBACKER			
"E"			
3038	5-p	Touring	\$1,750
3068	7-p	Touring	1,795
2953	4-p	Roadster	1,795
3116	5-p	Coupe-Sedan	1,495
3202	5-p	Brougham	1,695
3092	4-p	Coupe Roadster	1,920
3317	5-p	Sedan	1,995
3353	7-p	Sedan	2,195

"B-8"			
3227	4-p	Roadster	\$2,195
3315	5-p	Touring	2,150
3355	7-p	Touring	2,195
4-p	Sup. Sp. Roadster	3,250	
3445	5-p	Coupe Sedan	2,095
3486	5-p	Brougham	2,195
3345	4-p	Coupe Roadster	2,320
3603	5-p	Sedan	2,495
3640	7-p	Sedan	2,595
4-p	Sup. Sp. Sedan	5,000	

ROAMER			
"6-50-55"			
5-p	Spec. Tourer	\$1,295	
5-p	Spec. Sp. Tourer	1,395	
2-p	Bus. Coupe	1,395	
5-p	Coupe	1,395	
5-p	Sedan DeLuxe	1,695	

"6-54-E"			
4-p	Roadster	\$2,385	
4-p	Tourer	1,985	
4-p	Sport	2,285	
7-p	Tourer	2,285	
3-p	Cabriolet	2,750	
5-p	Sedan	2,950	

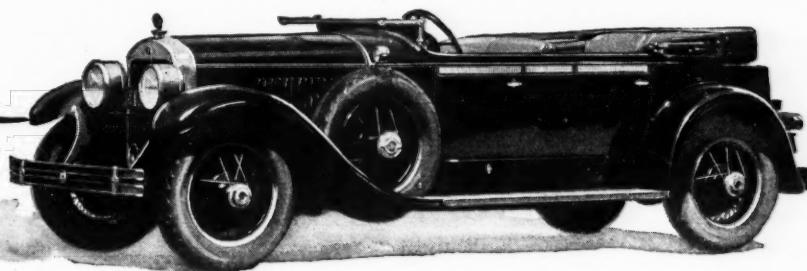
"4-75-E"		
"Custom Built"		
----- 2-p	Speedster	\$3,435
----- 3-p	Sport	3,235
----- 4-p	Tourer	2,935
"8-88" (138 in. W. B.)		
4-p	Roadster	\$2,735



*This list comprises cars distributed on a national basis*

[illegible]

—



*50 Body Styles and Types*

*500 Color Combinations*

*Standard—Fisher Custom Built—Fleetwood Custom Built*

Cadillac's genius for leadership was never so manifest as today, when, following on the heels of the most successful year in its history, when sales increased 87.5 per cent, Cadillac inaugurates the unprecedented plan of providing 500 color and upholstery combinations, and 50 body styles and types.

Thus to the unequalled performance of the new, 90-degree, 8-cylinder Cadillac is added unexampled luxury and distinction—with the widest possible latitude for individuality in the selection of body style, color and upholstery.

Simultaneously Cadillac has added new improvements and refinements—notably in an exclusive cushion spring design that is incomparably luxurious and easeful; in added niceties of trim and fitments; in the development of new lines with larger and more curving fenders; a new radiator shell design; new and larger lamps—refinements which, in combination with an unapproached range of body styles and color selections, place the new Cadillac on a commanding pinnacle of individualized luxury and distinction.

NEW 90 DEGREE

# CADILLAC

DIVISION OF GENERAL MOTORS CORPORATION





# Mechanical Specifications of Current Passenger Car Models—Continued

(This list comprises cars distributed on a national basis)

(From page 46)

MAKE AND MODEL	Wheel Base (Inches)	Tire Size	Decimals-Balloons	ENGINE										ELECTRICAL SYSTEM		Clutch—Type and Make	Gear Set—Make	Universal—Type and Make	REAR AXLE		BRAKES		Steering Gear—Make	Rear Springs—Type and Length	Chassis Lubrication—Type and Make	ABBREVIATIONS—NAMES OF MFRS. OF STOCK PARTS			
				Model	Number and Cyls.	Rated H.P.	Placment	Valve Arrange-ment	Camshaft Drive	Piston Material	No. Main Bear.	Crankshaft Vibs	Oil System	Oil Cleaner?	Cooling System				Thermosstat?	Radiators?	Carburetor	Air Cleaner?					Ignition System	Generator and Starter Make	Type and Make
Farmon.....74	136	34x7 30	32x6 20	Ow.	74	6-33x45	33.8	I	He.	Al.	3	N	P	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	A-K—Atwater Kent
McFarlan.....SV	127	32x6 20	32x6 20	Wis.	Y	6-33x45	27.3	I	Ch.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	A-L—Auto-Life
McFarlan.....St. 8	131	33x6 20	32x6 20	Lyo.	Al	6-34x43	33.8	I	Ch.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Al—Alameda
McFarlan.....TV	141 1/2	33x6 20	32x6 20	Ow.	Al	6-34x43	48.6	I	He.	Al.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Alm—Almetal
McFarlan.....London	128	32x6 20	32x6 20	Ow.	81	6-34x43	27.3	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	B&B—Borg & Beck
McFarlan.....Series A	113	30x5 25	30x5 25	Con.	72	6-33x43	23.4	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	B-L—Brown-Liepe
McFarlan.....6-60	110	29x4 75	30x4 75	Con.	Spec.	6-23x43	19.8	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Ba—Bassett cups
Light Six	108	30x4 75	30x4 75	Ow.	6	6-34x43	21.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Ca—Carter
Advanced	121-127	32x6 00	32x6 00	Ow.	261	6-31x45	28.4	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Special	112 1/2	31x5 25	31x5 25	Ow.	231	6-33x43	23.4	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Standard	113	30x5 25	30x5 25	Ow.	30E	6-23x45	19.8	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Oldsmobile	106 1/2	30x4 95	30x4 95	Ow.	30E	6-23x45	19.8	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Continental	96	29x4 40	29x4 40	Ow.	30E	6-23x45	15.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Idemobile	100 1/2	30x4 95	30x4 95	Ow.	30E	6-23x45	15.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	91	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-Spl.	Var.	E-R	E-R	Ow.	Ow.	Bowen	Clc—Cleveland
Verland	93	29x4 40	29x4 40	Ow.	91	6-33x43	19.6	I	He.	Cl.	3	N	Pu.	N	N	N	N	Delco	Delco	D. Long.	W-G.	m-S							

[" . . . that the American family may have, at a moderate investment, a car which gratifies their finer tastes as well as satisfies their every need. . . ."]

# ADDED POWER : LONGER LIFE : SMOOTHER PERFORMANCE : ADDED DRIVING EASE AND SECURITY : GREATER ECONOMY : FINER APPOINTMENTS : ADDED BEAUTY :: AT NO INCREASE IN STANDARD PRICES

Oldsmobile keeps faith with its public trust—

. . . returns to the public the benefits of manufacturing advantages and economies created by the greatest year in Oldsmobile history!

Today Oldsmobile presents *brilliant progress without basic change* in the car which has won its way to public preference by sheer surpassing merit—

. . . new features of known value—

. . . improvements of demonstrated worth—proved in tests on General Motors Proving

Ground, to provide even livelier, smoother performance, even longer life, even greater operating economy, than already characterize Oldsmobile Six!

Consider the beauty and luxurious new appointments of its Fisher body—

. . . go over the car, point by point, study every new feature—

. . . know, as only study can tell you, what a truly great car this is!

The Oldsmobile franchise spells opportunity . . . and today is sought after more than ever before.

## OLDSMOBILE

Product of GENERAL MOTORS

ENLARGED L-HEAD ENGINE . . CRANKCASE VENTILATION . . DUAL AIR CLEANING . . OIL FILTER . . HARMONIC BALANCER . . TWIN-BEAM HEADLIGHTS CONTROLLED FROM STEERING WHEEL . . TWO-WAY COOLING . . THREE-WAY PRESSURE LUBRICATION . . FULL AUTOMATIC SPARK CONTROL . . THERMOSTATIC CHARGING CONTROL . . TAPERED, DOME-SHAPED COMBUSTION CHAMBERS . . HIGH VELOCITY, HOT-SECTION MANIFOLD . . SPECIAL DESIGN, LIGHT CAST-IRON PISTONS . . HONED CYLINDERS . . SILENT CHAIN DRIVE . . BALLOON TIRES . . EXCLUSIVE CHROMIUM PLATING . . DUCO FINISH . . NEW BEAUTY OF LINE AND APPOINTMENTS IN FISHER BODIES . . MANY OTHER FEATURES OF DEMONSTRATED WORTH, AT NO INCREASE IN STANDARD PRICES



**In presenting this page I want to impress every dealer with the completeness of the Walker Line. The Walker name means something to you. It indicates that back of every Walker Jack there is eighteen years of jack building experience . . . This is your assurance of quality, design and service. When you are buying jacks, whether for resale to passenger car or truck owners, or, for service in your own garage, the selection of a Walker Jack will prove a good investment.**

*Willard Walker*

President  
Walker Manufacturing Co.  
Racine, Wis.



NO. 740  
WALKER  
ROLL-A-CAR



NO. 715  
WALKER  
LIFT-A-CAR



NO. 1  
WALKER  
PASSENGER  
CAR JACK



NO. 3  
WALKER  
PASSENGER  
CAR JACK



NO. 216B  
WALKER  
TRUCK JACK



NO. 600  
WALKER  
PASSENGER  
CAR JACK



NO. 605  
WALKER  
PASSENGER  
CAR JACK



NO. 126  
WALKER  
BALLOON  
TIRE JACK



NO. 610  
WALKER  
PASSENGER  
CAR JACK



NO. 520  
WALKER  
BALLOON  
TIRE JACK



NO. 620  
WALKER  
BALLOON  
TIRE JACK



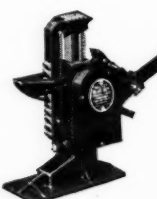
NO. 251  
WALKER  
TRUCK JACK



NO. 475  
WALKER  
TRUCK JACK



NO. 266  
WALKER  
TRUCK JACK



NO. 125  
WALKER  
SERVICE JACK



NO. 5  
WALKER  
TRUCK JACK



NO. 55  
WALKER  
TRUCK JACK

# Walker Jacks

*"Dependable in Service"*



# "Bull Dog"

THE BEST ACCELERATOR  
 BEST ACCELERATOR  
 ACCELERATOR  
 FOR FORDS  
 FORDS  
 THE BEST  
 BEST  
 ACCELERATOR  
 FOR FORDS  
 FOR FORDS  
 THE BEST



## Rolling Up Sales

**P**USHING the New Bull Dog Foot Accelerator is not only good business, but profitable business as well. The pedal with its exclusive comfortable foot rest—with its instant attachment and detachment—with its wonderful appearance attracts and sells Bull Dogs in ever increasing volume.

Then, too, the Ford Owner knows the Bull Dog construction under the floor board is right. It is nothing new and untried—it is the result of years of success.

The Bull Dog Accelerator complete sells for \$1.50. The pedal separately—for Chevrolets and all other cars with push rod type accelerators—75c.

The W.H. Thomas Mfg. Co. Spencer, Ia



# Announcing the New Moto-Gard



**FOR DEALERS**

*Who are Proud of*

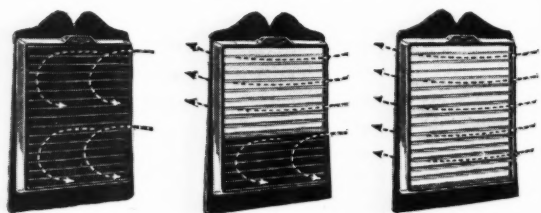
**SATISFIED CUSTOMERS**

**O**NE Moto-Gard sale gives you as much profit as two or more low-priced shutter sales. Its many new individual features make big talking points which will easily sell Moto-Gards to your customers. These features have this real appeal, because Moto-Gard was designed only after an exhaustive survey as to what car owners wanted and needed for the best cold weather protection for their cars.

You can test the Moto-Gard any way you want—under any conditions—and then you'll know it will permanently please your customers. You will not have service calls—you will not have requests to "take off that ..... thing"—after you install one.

*The initial profit you make on Moto-Gards is large—and it is yours to keep.*

*Isn't that the kind of proposition you like to handle?*



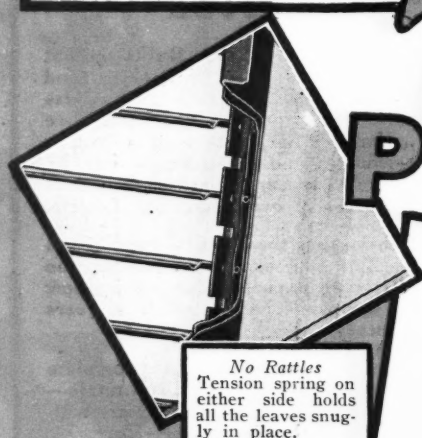
#### TRIPLE SERVICE

In real cold weather, completely closed; in mild weather, partly open and partly closed; in warm weather, completely open.



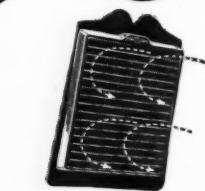
#### ← OPERATED FROM DASH

The shutter is operated from the dash by a positive thumb screw control. When the thumb screw opens the upper part of shutter three-quarters of the way, a trip mechanism automatically opens lower leaves. This ingenious feature is not found on any other shutter.



**No Rattles**  
Tension spring on either side holds all the leaves snugly in place.

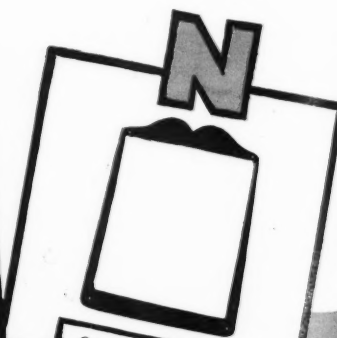
## 7 Big Selling Points



**Air Tight**  
Leaf edges nest together. Frame overlaps leaves all around.



**Opens Inwardly**  
Narrow, rigid leaves, opening inwardly, make unusually thin shutter. Gives a built-in appearance.



**One Piece Frame**  
Frame stamped in one piece from 20 gauge steel. No rivets or bolts used.

# Triple Service Shutter

Sales Supported by !  
Far-Reaching Advertising !

A FAR-REACHING advertising effort will tell the story of Moto-Gard to the motoring public.

The Saturday Evening Post, Motor, and the leading newspapers in the larger trade centers where radiator protection is most needed, are on the list of media which will carry Moto-Gard advertising.

Dealers will be supplied with striking window and counter displays which will tell motorists of the advantages of Moto-Gard for protecting their cars in cold weather.

Envelope enclosures and attractive folders for use in circularizing consumers will reinforce national and trade advertising and will help pave the way to larger sales.

Metal signs for dealers to hang in prominent places will point the consumer's way to the dealer who has Moto-Gard Shutters and Service.

Supported by this comprehensive publicity campaign, the Moto-Gard Triple Service Shutter, with its distinctive and exclusive features will prove to be one of the season's biggest profit-makers for you.

Get the facts about this sales opportunity.  
Write today for complete information on  
the new Moto-Gard Shutter.

**The Brewer-Titchener Corporation**

20 Port Watson St.

Cortland, New York

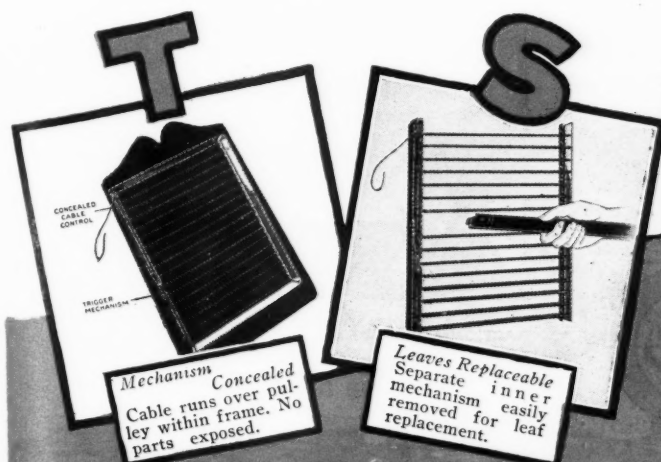


## CARS FOR WHICH Moto-Gard WILL BE SUPPLIED

Ford } \$9.50  
Chevrolet }

Overland 4  
Overland 6  
Star 4  
Star 6  
Dodge  
Chrysler 4  
Nash Light 6  
Jewett  
Oldsmobile  
Pontiac } \$12.50

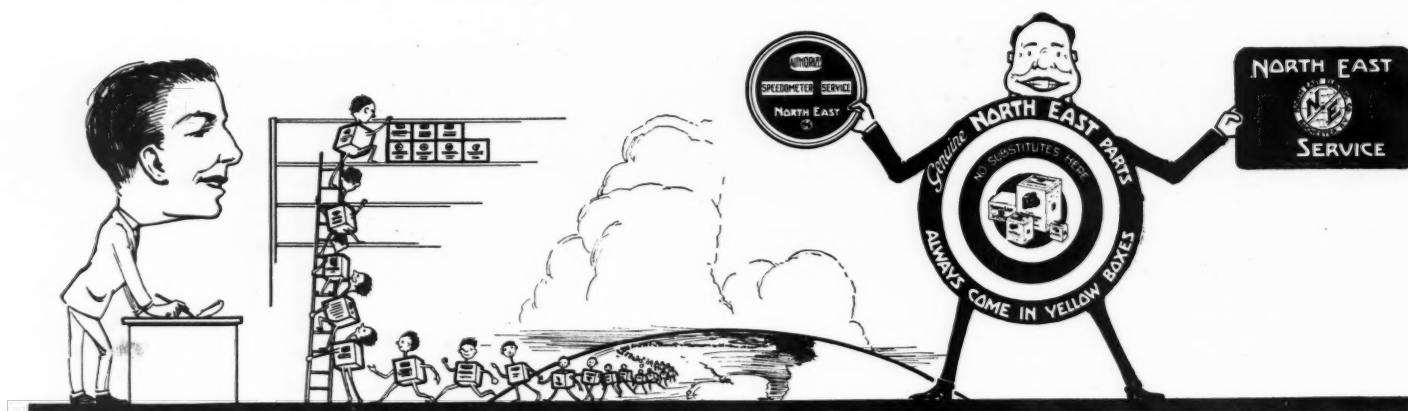
Studebaker Standard Six  
Studebaker Special Six  
Studebaker Big Six  
Buick Standard Six  
Buick Master Six  
Nash Special Six  
Nash Advanced Six  
Willys-Knight 70  
Hupp 6  
Hupp 8-118"  
Hupp 8-125"  
Oakland  
Packard  
Paige  
Chrysler Six  
Flint 60  
Flint 80  
Jordan  
Reo } \$15.50



For cars not covered by above list, furnish the jobber with a paper pattern of radiator opening and he can furnish a trimmed shutter for you.

In exclusive and individual features,  
Moto-Gard marks a distinct advance  
in shutter construction.





## Who said they're hard to get?

*Yellow Boxes are distributed by over 800 Authorized Service Stations*

**Y**OUR customers are demanding Genuine Parts. Your reputation and business future are demanding Genuine Parts. Your profits are demanding Genuine Parts.

Don't wait until you have to apologize or explain why you don't carry them.

Get in line now and stock up with the Parts you ought to have.

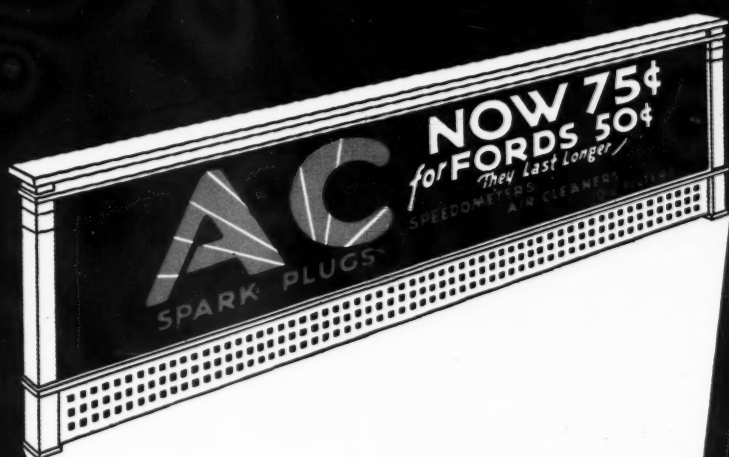
Let the nearest Authorized North East Service Station advise you in the selection of the parts you need for your North East business. They'll tell you about the **new trade discounts**, too.

North East Automotive Equipment is manufactured by the NORTH EAST ELECTRIC CO., Rochester, N. Y.

Genuine North East Service Parts are distributed through NORTH EAST SERVICE INC., Rochester-Atlanta-Chicago-Detroit-New York-Kansas City-San Francisco-Paris-London-Toronto. Authorized North East Service Stations are to be found in cities of importance throughout the world.

Repair Concerns, Parts Dealers and Garages are entitled to display the North East Genuine Parts BULLS-EYE Window Sign when they conform to the North East Genuine Parts policy.





## Why AC Spark Plugs—

Have the biggest demand and the greatest sales possibility for the dealer.

## Because—

The following cars and 124 others use them as original equipment.

BUICK  
CADILLAC  
CASE  
CHANDLER  
CHEVROLET  
CHRYSLER  
CLEVELAND  
DAVIS  
ESSEX  
FLINT  
HUDSON  
JEWETT  
KISSEL  
MARMON  
McFARLAN  
NASH  
OAKLAND  
OLDSMOBILE  
PAIGE  
PONTIAC  
STAR  
STEARNS-KNIGHT  
WILLS SAINTE CLAIRE

AC equipment business—today more than 50% of the entire car production—offers big sales possibilities because of the assured replacement demand from owners of AC-equipped cars.

### *Now Popularly Priced*

AC or AC Carbon Proof, 75c  
AC 1075 (for Fords) . . . 50c

Heavily advertised through painted highway bulletins, national magazines, newspapers and dealer helps.

Likewise they are the most profitable for the dealer to sell.

### AC Spark Plug Company

FLINT, Michigan

AC-SPHINX  
Birmingham  
ENGLAND

Makers of  
AC Spark Plugs  
AC Speedometers  
AC Air Cleaners  
AC Air Filters

AC-TITAN  
Levallois-Perret  
FRANCE

### AC Speedometers

The AC Speedometer for Fords—now \$10.00—is a full-sized speedometer, registering speed, total and trip mileage, the same previously sold at \$15.00.

### AC Air Cleaners

Prevent dust from entering the engine through the air intake of the carburetor.

Packed complete with all installation attachments—easily mounted and reasonably priced.

### AC Oil Filters

Positive protection against engine wear.

Keeps the oil clean, making it unnecessary to change oil every 500 miles.





This cut-away view of the new **James Self-Cooling Valve** shows the exclusive patented Grant *hollow-head* construction. Three vent holes provide ready exit for heat within the head. Expansion and contraction are minimized—the valve is lighter, a much desired quality where power and speed are vital.

# of the Industry! the New~ **JAMES** Self-Cooling Valve

Leading automotive engineers have pronounced the new **James Self-Cooling Valve** to be the most sensational development in valve design and construction ever achieved.

This new valve is *Self-Cooling*—a condition never before obtainable in a valve—yet vital in this day of high speed combustion engines.

This outstanding accomplishment is obtained by the effective application of a well-known law of physics—

Whenever air circulates, a cooling condition exists—even though the air (or gases) be hot!

This is exactly what happens in the new **James Valve**. As the hot gases rush by the head, they create a suction, drawing out the heat within the head and creating a *cooling action*! Heat is dissipated at its very source! And in addition there is no mass or metal in the head to hold and drive heat down the stem as in the ordinary valve.

But that is not all—to make this valve the last word in efficiency a new metal has been created—Ni-chro-loy.

This wonderful metal will not *burn, scale, warp or pit*, even at temperatures as high as 3000° Fahrenheit! Moreover, to retain *all* the original structural qualities of the metal, the **James Self-Cooling Valve** is *cast*—not *forged*.

And now for the results! This new valve positively will not *warp, pit, scale or burn*. Used in heavy duty buses—trucks—high-powered passenger cars—marine and airplane motors—it radically improves engine performance and out-lives many times even the finest of valves so far produced.

Over three years have been devoted to intensive tests—of every conceivable type and condition—with the result that this new valve shows a performing ability far beyond any results heretofore obtained.

Without question, it is destined for universal acceptance—and unbounded popularity.

**Distributors and Dealers!**

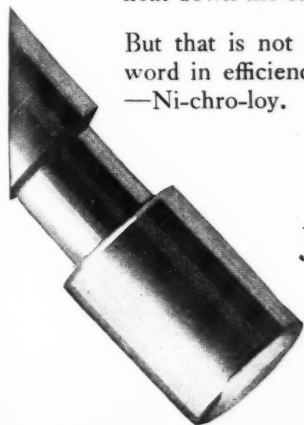
Write or wire for full details.

**JAMES MOTOR VALVE COMPANY**

1314 Maple Street

Detroit, Michigan

Makers also of the well-known  
*James Two-Piece (cast-iron head) Valve*





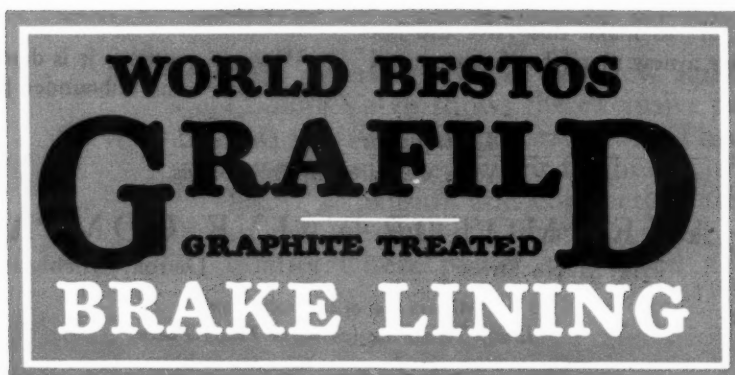
# POSITIVE

## Action



*Because—*

Graphite filling makes Grafild's action positive under all conditions. Absence of cotton binder makes them always dependable!



World Bestos Corporation, 52 Courtland Street, Paterson, N. J.

# Delta

## AUTO SPOTLIGHT



MODEL 24 \$3.00 LIST  
Canada, \$4.00

### Thoroughbreds

All Delta reflectors are triple silvered—brackets drawn metal—hand buffed nickel trimmings. Seven inspections are made during manufacture. Any Spotlight that shows the slightest imperfection is rejected. We insist that every Delta product marketed must be a thoroughbred. Wouldn't you rather handle thoroughbreds?

#### Models and Prices

	U. S. List	Canada List
No. 50, RoadLite, with bracket mounting . . .	\$4.50	\$6.50
No. 51, RoadLite, with pedestal mounting . . .	4.50	6.50
No. 24, 4 1/2 in. black enamel, nickel trimmed . . .	3.00	4.00
No. 25, 4 1/2 in. all nickerled . . . . .	4.00	6.00
No. 20, 5 1/2 in. black enamel, nickel trimmed . . .	4.25	5.75
No. 23, 5 1/2 in. all nickerled . . . . .	5.50	8.25
No. 22, as No. 20 except with "stop" attachm't . . .	4.75	6.50
No. 21, Closed car attachment for 20, 22, 23 . . .	.25	.35
No. 66, Inside Control Spotlight . . . . .	6.00	9.00
No. 2, Ashette Auto Ash Receiver . . . . .	1.10	1.50

See your jobber for deliveries. Write to us for further information. Watch for our advertisements in Liberty Magazine.

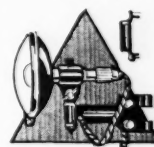
DELTA ELECTRIC COMPANY  
503 Delta Block Marion, Indiana



RoadLite 50, \$4.50



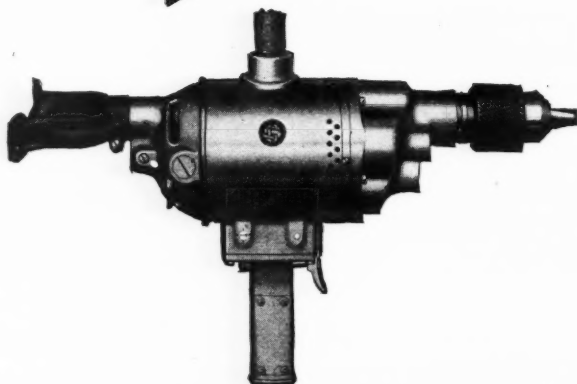
RoadLite 51, \$4.50



Spotlight 20, \$4.25



# Superior Points



U. S.  $\frac{5}{8}$ -inch Drill—an ideal power unit for driving cylinder reconditioning tools such as hones and abrasive reamers. Speed under load, 400 r. p. m. Operates on alternating or direct current circuits (60 cycles or less) with voltage 10 per cent higher or lower than indicated on name plate. Adaptable to 32-volt or 220-volt, and to bench and post drill stands.

Export Sales Department  
Westinghouse Electric International Co.  
150 Broadway, New York City, N. Y.

Universal motor with silk-covered armature wire; chrome nickel steel gears, hardened, run in grease—three-jaw screw back chuck—quick make, quick break two-pole trigger switch—SKF Ball Bearings throughout—1-piece frame and commutator head prevents misalignment—excess power for the heaviest duty jobs around your shop. Perfectly balanced.

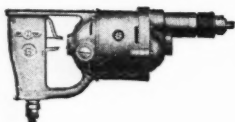
*Write for Catalog H*



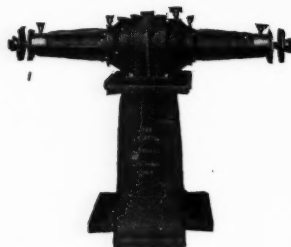
The United States Electrical Tool Co.  
Cincinnati, Ohio, U. S. A.



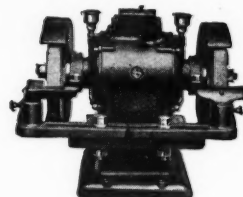
## Portable Electric Drills Grinders—Polishers



U. S.  $\frac{5}{8}$ -inch Drill comes equipped with twelve feet of flexible rubber-covered cable and armored attachment plug. Speed under load, 1,000 r. p. m. 3 SKF Ball Bearings. Operates on alternating or direct current. Adaptable to 32-volt or 220-volt, and to bench grinding or polishing as well as to bench and post drill stands.



U.S. Buffing, Polishing and Tire Roughing Machine.  $\frac{1}{2}$  to 15 H. P. Operates on 110, 220, 440, 550 volts—1, 2 or 3 phase—25, 40, 50 and 60 cycle a. c., and 110, 220, and 550 volts d. c.



U.S. 8", 10" or 12" Grinder—the practical tool for the automotive service station. 40 degree a. c. or d. c. motors mounted on SKF Ball Bearings. Adjustable tool rests. The standard of all quality grinders.

*Oldest Builders of Electric Drills and Grinders in the World*

**Hycor**  
SETS A NEW BRAKING STANDARD  
**BRAKE LINING**

For  
better  
driving

## THE MANHATTAN RUBBER MFG. COMPANY

*Executive Offices and Factories: Passaic, N. J.*

**Branches:**

Chicago  
Detroit

New York  
Birmingham

Boston  
Cleveland

Joplin  
Los Angeles

Minneapolis  
New Orleans

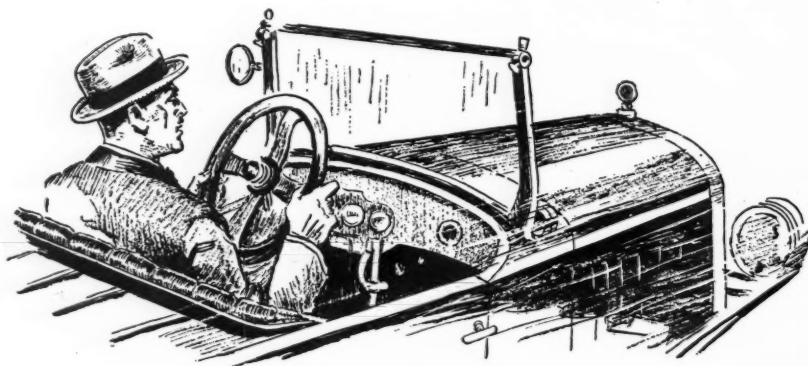
Philadelphia  
Pittsburgh

Salt Lake City  
St. Louis



# RUST---

## *The Unsuspected Cause of*



**Overheating  
Power Losses  
Excess Carbon  
Radiator, Water Pump  
and Hose Connection  
Leaks**

## 9 Engines out of 10 Clogged!

TODAY, only one car in ten operates at full efficiency. Power lags. Carbon forms rapidly. Cars that should give twenty miles to a gallon only deliver 16!

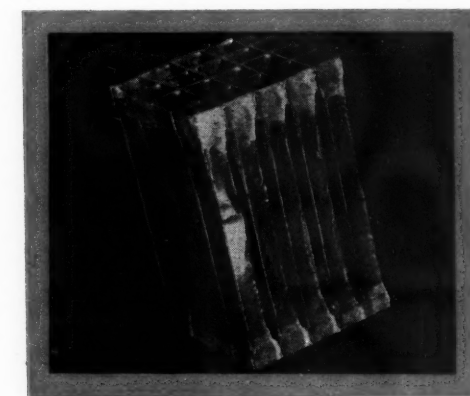
### *The New Discovery*

The chief cause, engineers agree, is unsuspected by most drivers. It has been found that in 9 cars out of 10 cooling systems are rust clogged—Choked! Water jackets will rust—This rust lodges in the narrow radiator water channels. Clogs them. Water just seeps by—is only partially cooled. It brings no relief to the scorching cylinder walls. This prevalent trouble takes its costly toll in power losses, excess carbon, high gas consumption.

### *Relief in 20 Minutes*

All this can now be prevented. A remarkable new preparation, *No*

*Four Times  
a Year*



*Rad Rust*, circulates through the cooling system, ferrets out all rust and dirt, eliminates it through the overflow pipe. Engines operate at full efficiency. Radiator leaks are prevented, as rust does not get a chance to eat through the cores. Water reaches the jackets cool and refreshing. Here is complete safety.

### *Spark Plug Turnover*

*No Rad Rust* gives visible proof that it does the work. Motorists can see the rust and dirt pour out. Thousands use it—four times a year. Four times a year—that's spark plug turnover—Investigate. Now—write for complete information and discounts on *No Rad Rust*.  
**No Rad Rust Corp., 415 North Water Street, Lancaster, Pa.**

*A product of the makers of the famous W. J. Boiler and Heating System Cleanser.*

# NO RAD RUST

# You Don't Have to Take a SUBSTITUTE

**T**HERE'S a good APEX Jobber in every distributing center in the United States. Don't take a substitute for the

genuine. Write us and we'll tell you where you can get the real APEX.

## Apex Innerings Guaranteed to

stop oil pumping and piston slap; increase power pick-up and performance without reboring. APEX cannot cause extra wear on cylinder walls; cannot overheat the motor; cannot even interfere with the oil film between ring faces and cylinder walls.

No imitation can be made like APEX. Only APEX has long reverse curves that gently cushion the piston slap. Only APEX has

rounded points of contact that cannot wear through and break; only APEX cut between the crimps can cushion the piston ring equally the entire circumference; only APEX has patented engineered shape that no one else can duplicate. For these reasons no imitation can safely do what APEX claims.

**THOMSON  
MFG. CO.**

*(Originators and Pat-  
entees of Innerings)*

Dept. 7

Peoria, Illinois



# APEX GENUINE Innerings



# FULL PROTECTION AGAINST THEFT



**One key locks  
BOTH ignition  
& transmission**

## SOMETHING NEW TO TALK ABOUT

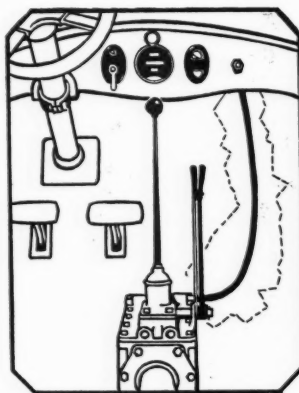
**A transmission lock controlled by the ignition key**—that is something new and different in automotive circles.

Dealers who are ready to furnish Blossom Locks on the new cars they sell have a feature to talk about which is unique and distinctive. It is a feature which adds substantially to the salability of their cars.

For, with the number of stolen cars daily increasing, plus the fact that 80% of these cars are left unlocked by owners because of inconvenient locks, the public is beginning to demand an efficient and safe method of locking cars.

And there is only one such method. Only a transmission lock is theft-

proof and the only key about a car which is forget-proof is the ignition key. Only in the Blossom Lock will you find these features combined. It is the only lock on the market which requires but ONE KEY to lock BOTH ignition and transmission coincidentally.



The Blossom Lock is applicable to any gear-shift car. Present stock model is designed particularly for Chevrolets and Pontiacs, both of which are enjoying unprecedented sale.

Dealers selling and servicing these makes of cars should write or wire at once for complete details giving name of distributor. **THE BLOSSOM LOCK COMPANY, CLEVELAND, OHIO.**

# BLOSSOM COINCIDENTAL LOCK

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# The Greatest DEALER PROFIT Opportunity *in the Automobile Industry*

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# PRINCIPAL POINTS OF SUPERIORITY

- 1 Both Fours and Sixes in popular models of surpassing style, more power and superior quality.
- 2 All cars listing in the less-than-\$1,000 price class that constitutes 85% of the total automobile market.
- 3 A discount schedule based on monthly volume which offers live merchandisers the longest discount in this volume market.
- 4 No shipping schedule—take what your market calls for.
- 5 Your local market as large as you prove able to develop.
- 6 Consistent cooperation in developing sales.

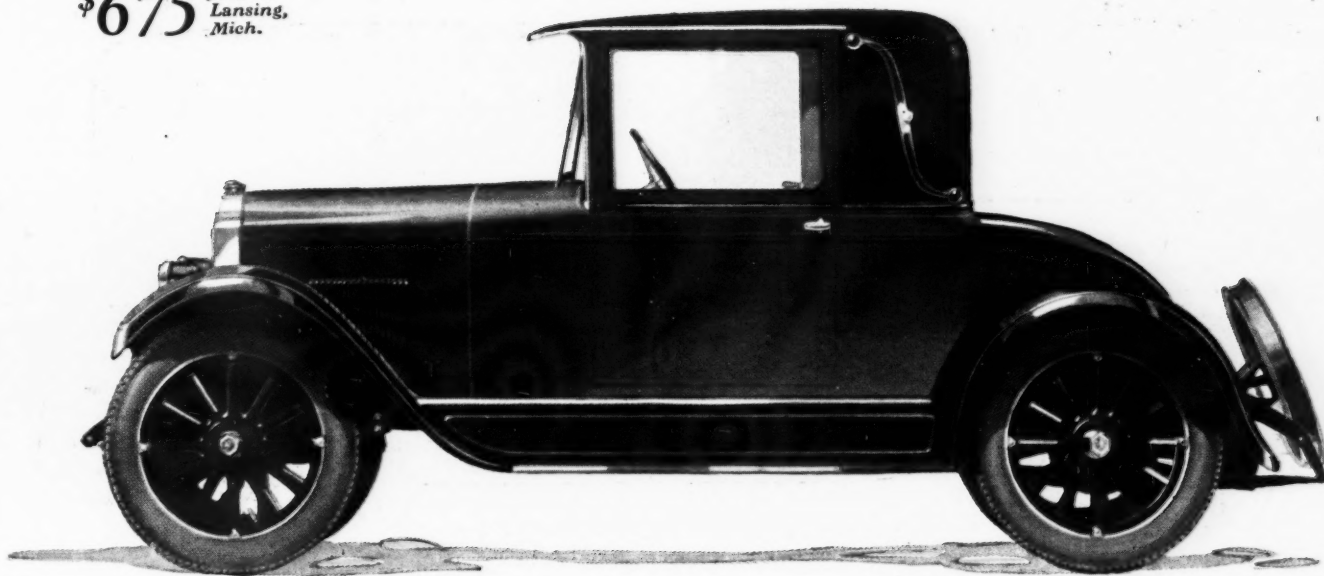
## LOOK AT THE LINE

of greatly improved Star Fours and Sixes  
as illustrated on the following pages:



IMPROVED  
STAR FOUR  
COUPE

\$675 f. o. b.  
Lansing,  
Mich.



Persian blue and black polished lacquer finish. 4-cylinder, 30-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Balloon tires.

Low-cost Transportation  
**Star Cars**  
4 and 6 Cylinder Types

IMPROVED  
STAR FOUR  
COACH

\$695 f. o. b.  
Lansing,  
Mich.



Persian blue and black polished lacquer finish. 4-cylinder, 30-brake horsepower, highest grade motor. (1926 Yosemite Economy Run winner in its class). Balloon tires. Roomiest Hayes-Hunt body.



IMPROVED  
STAR FOUR  
SEDAN

**\$795** f. o. b.  
Lansing,  
Mich.

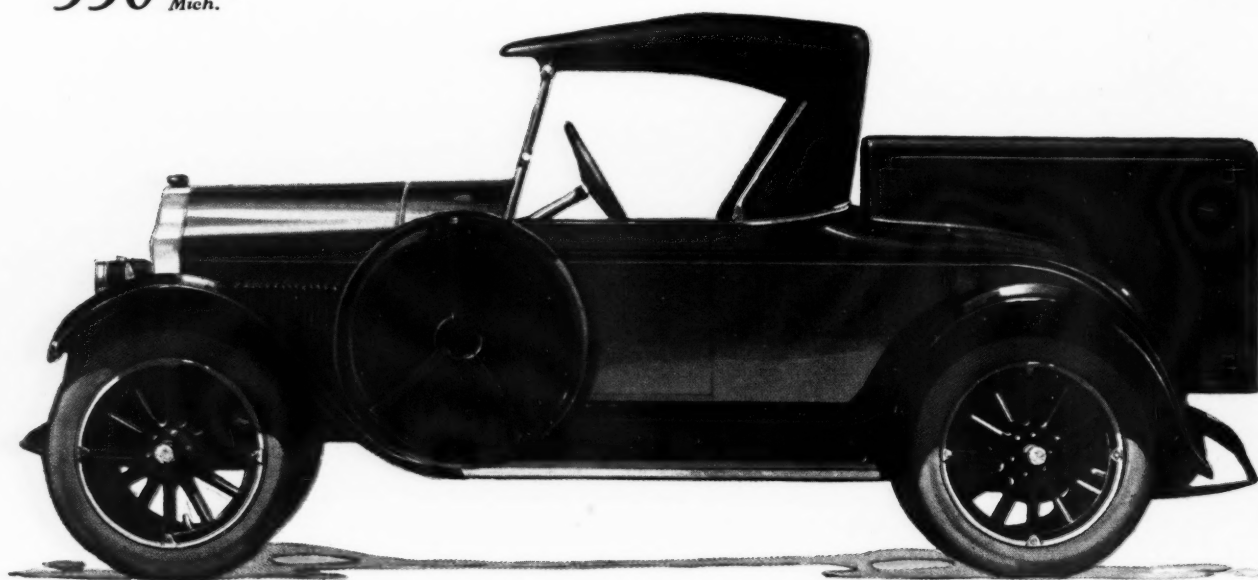


Persian blue and black polished lacquer finish. Roomiest Hayes-Hunt body. 4-cylinder, 30-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Balloon tires.

Low-cost Transportation  
**Star Cars**  
4 and 6 Cylinder Types

STAR FOUR  
CONVERTIBLE  
ROADSTER

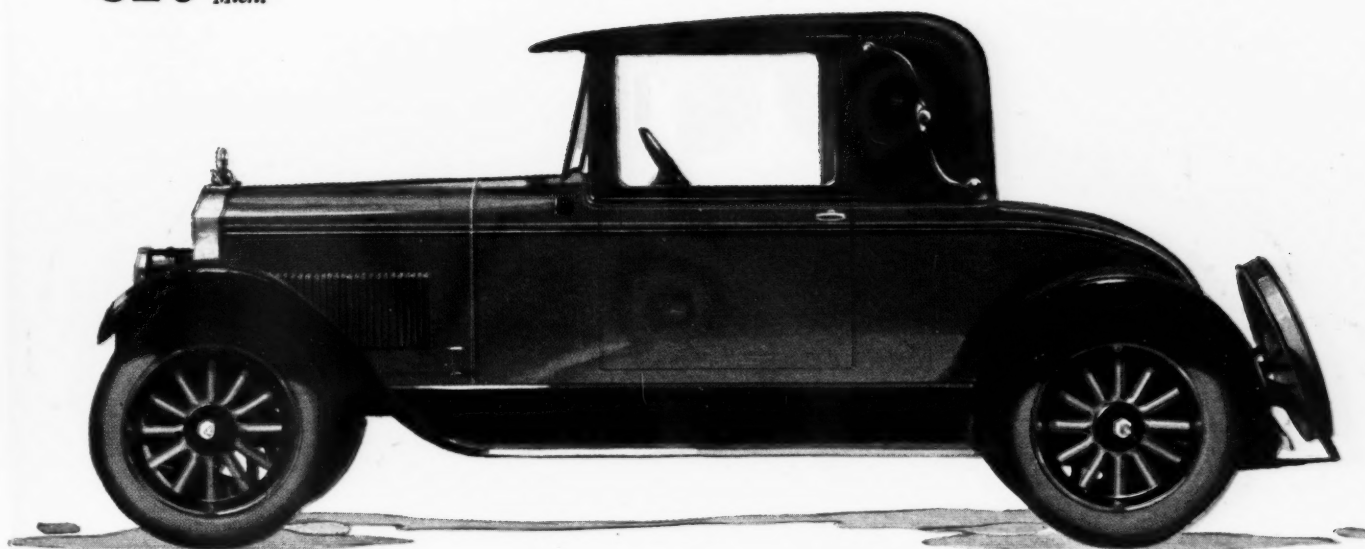
**\$550** f. o. b.  
Lansing,  
Mich.



Persian blue polished lacquer finish. Cord tires. 4-cylinder, 30-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Rear deck cover instantly removable for substitution of 42-inch standard commercial box. (Box and spare tire not included in price).

THE NEW  
STAR SIX  
COUPE

**\$820** *f. o. b.  
Lansing,  
Mich.*



Bronze green and black polished lacquer finish. Hayes-Hunt body. 6-cylinder, 40-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Balloon tires.

*Low-cost Transportation*  
**Star  Cars**  
*4 and 6 Cylinder Types*

THE NEW  
STAR SIX  
COACH

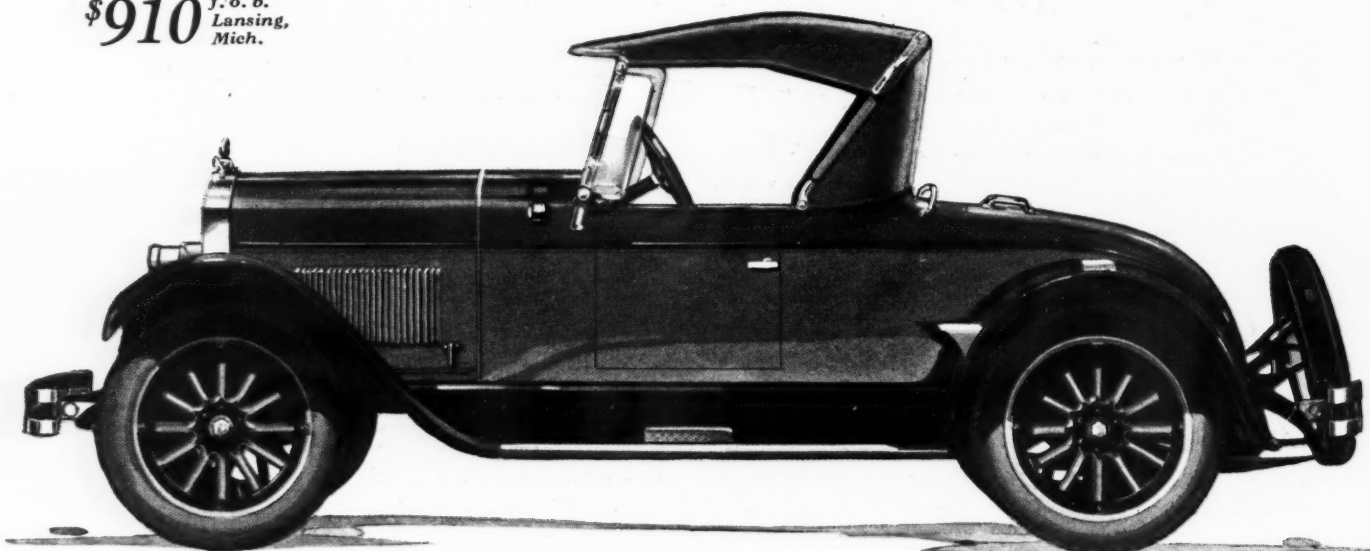
**\$880** *f. o. b.  
Lansing,  
Mich.*



Bronze green and black polished lacquer finish. Hayes-Hunt roomiest body. 6-cylinder, 40-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Balloon tires.

**STAR SIX  
DELUXE SPORT  
ROADSTER**

**\$910** *f. o. b.  
Lansing,  
Mich.*



Artillery gray and beige-brown polished lacquer finish. Khaki top. Genuine leather upholstery. 5 Balloon tires. Full sport equipment as illustrated. 6-cylinder, 40-brake horsepower motor. (1926 Yosemite Economy Run winner in its class).

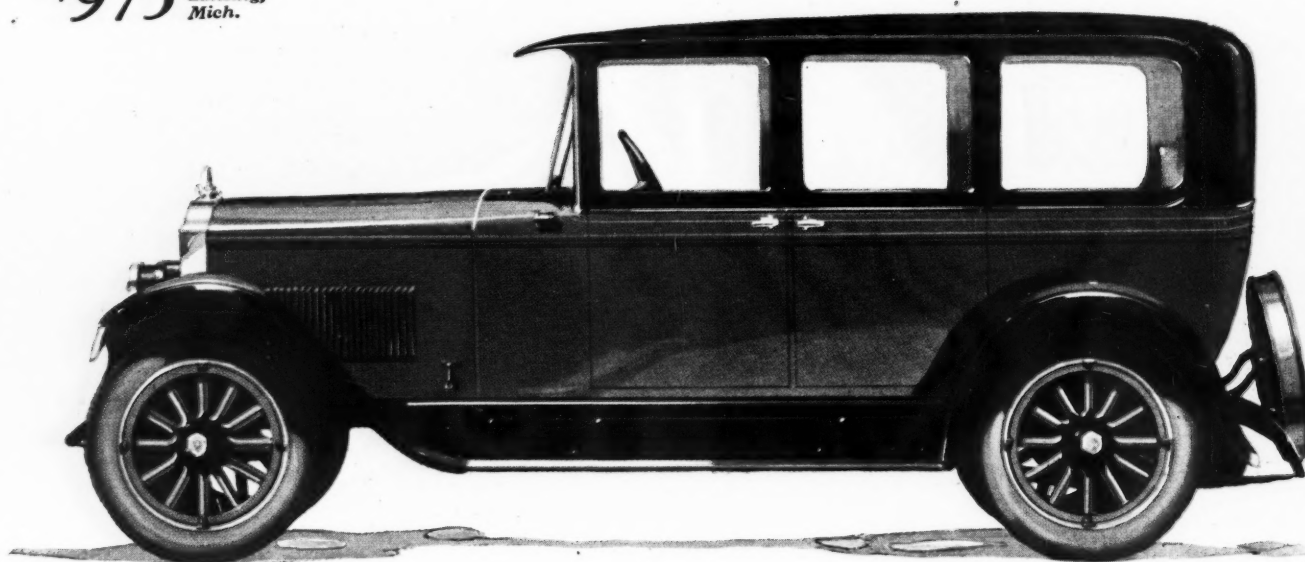
*Low-cost Transportation*

**Star Cars**

*4 and 6 Cylinder Types*

**THE NEW  
STAR SIX  
SEDAN**

**\$975** *f. o. b.  
Lansing,  
Mich.*



Bronze green and black polished lacquer finish. Roomiest Hayes-Hunt body. 6-cylinder, 40-brake horsepower motor. (1926 Yosemite Economy Run winner in its class). Balloon tires.



## Why Star Cars Have More Power

**Highest Quality Motor.** Star Four Motor Develops 30-brake horsepower. Has won every hill climbing contest against all other entrants of any make or price. Won the celebrated 1926 Yosemite Economy Run (sea level to 6,000 ft. elevation) with a gasoline mileage of 29.09.

Has full force-feed lubrication. Front end chain drive. Honed cylinders, lapped piston pins. Aluminum alloy pistons. Bronze-backed piston pin and front end camshaft bearings. Fedder's radiator. Ran 100 miles low gear non-stop in July 1926 near San Antonio, Texas, without boiling

The Star Four owes its power and economy supremacy to the high speed of its motor, good compression, correct operating temperature, full force-feed lubrication and excellent carburetion of today's motor fuel.

The Star Six Motor develops 40-brake horsepower. Won the 1926 Yosemite Economy Run in the less-than-\$1,000 six-cylinder class with a gasoline mileage of 23.36. Motor of highest grade construction in its class, has no perceptible critical period, and is very flexible. 4-bearing crankshaft. Bronze-backed bearings; aluminum alloy pistons.

## Why Star Cars Have Superior Quality

All chassis main units separately demountable. Standard gear shift transmission. Spiral bevel rear axle gears. Single-plate dry-disc clutch. Five chassis cross members. Transmission sub-frame, mounted amidship.

All closed bodies are Hayes-Hunt rumble-free, composite wood and steel. Highest grade material and workmanship. All closed bodies have one piece tilting, full ventilating windshield; visor and cowl ventilators, and extended top streamline visors; automatic windshield wipers, rear view mirrors, rapid acting window regulators and good quality upholstery.

All models have radiator shells nicked on copper, aluminum spiders on steering posts, dash lamp, ammeter, oil pressure gauge, speedometer and choke pull.

All bodies are extra large both in length and width. In design, finish and appointments Star Cars are in a class by themselves—INCOMPARABLE.

## Models and Prices

*f. o. b. Lansing, Mich.*

### Improved Star Four

Commercial Chassis . . .	\$470.00
Convertible Roadster . . .	550.00
Touring . . . . .	550.00
Coupe . . . . .	675.00
Coach . . . . .	695.00
Sedan . . . . .	795.00

### The New Star Six

Chassis . . . . .	\$650.00
Touring . . . . .	725.00
Coupe . . . . .	820.00
Coach . . . . .	880.00
Sport Roadster . . . . .	910.00
Sedan . . . . .	975.00
Sport Coupe . . . . .	995.00
Landau . . . . .	995.00
<b>COMPOUND FLEETRUCK</b>	
Ton Chassis . . . . .	975.00

## Star Car Franchise the Most Desirable

1. *New Discount Plan*, with monthly volume bonus checks provides the most discount and the most dollars per sale of any line in the less-than-\$1,000 class.
2. *Star Cars—Fours and Sixes*—are in a class by themselves in price and value and easily lead the low-priced market in style and general quality.
3. *No Shipping Order*—leaves the dealer free to take cars when and as required to meet the sales possibilities of his local market.
4. *Ample Dealer Market*. Our policy ensures each dealer as large a market as he proves himself capable of developing in accord with Sales Development Plan mutually arranged at time of executing Selling Memorandum.
5. *Full Factory Cooperation* including national and keypoint advertising, free advertising literature. Experienced, strong, and enterprising leadership as proved by the rapid progress of the Star Car during the last year to the position of quality supremacy in the low-priced field.

## Exceptional Opportunities Available

Although desirous of closing any open points promptly there remain a number of major keypoints and still more good secondary trading centers which we have held open for dealers that measure up to the high quality of the Star line in financial strength, merchandising ability, and business integrity.

If you believe you can meet these requirements and desire to investigate any of these opportunities, wire or write our nearest wholesale office, as per addresses below.

### Wholesale Offices

DENVER, COLORADO  
Durant Motor Co. of Mich.  
First Nat'l. Bank Bldg.

DES MOINES, IOWA  
Durant Motor Co. of Mich.  
221 Equitable Bldg.

MEMPHIS, TENN.  
Durant Motor Co. of Mich.  
1108 Exchange Bldg.

GREENSBORO, N. C.  
Durant Motor Co. of N. J.  
Jefferson Standard Bldg.

MINNEAPOLIS, MINN.  
Durant Motor Co. of Mich.  
La Salle and 9th Sts.

WASHINGTON, D. C.  
Durant Motor Co. of N. J.  
216 Transportation Bldg.  
17th and H Sts.

OKLAHOMA CITY, OKLA.  
Durant Motor Co. of Mich.  
912 Colcord Bldg.

ST. LOUIS, MO.  
Durant Motor Co. of Mich.  
1810 Railway Exch. Bldg.

KANSAS CITY, MO.  
Durant Motor Co. of Mich.  
1603 Federal Reserve Bank Bldg.

JACKSONVILLE, FLA.  
Durant Motor Co. of N. J.  
916 Main Street

LANSING, MICH.  
Durant Motor Co. of Mich.

MILWAUKEE, WIS.  
Durant Motor Co. of Mich.  
630 First Wisc. Nat'l. Bank Bldg.

BOSTON, MASS.  
Durant Motor Co. of N. J.  
561 Park Square Bldg.

PHILADELPHIA, PA.  
Durant Motor Co. of N. J.  
121 N. Broad St.

ATLANTA, GEORGIA  
Durant Motor Co. of N. J.  
1327 Candler Bldg.

CINCINNATI, OHIO  
Durant Motor Co. of Mich.  
703 Dixie Terminal Bldg.

DALLAS, TEXAS  
Durant Motor Co. of Mich.  
1901 Magnolia Bldg.

CHICAGO, ILL.  
Durant Motor Co. of Mich.  
2437 South Michigan Ave.

PITTSBURGH, PA.  
Durant Motor Co. of N. J.  
406 Highland Bldg.

LOUISVILLE, KENTUCKY  
Durant Motor Co. of Mich.  
1312 Starks Bldg.

ELIZABETH, N. J.  
Durant Motor Co. of N. J.

## DURANT MOTORS, INC.

1819 BROADWAY, NEW YORK

Star Car Plants at Elizabeth, N. J., Lansing, Mich., Oakland, Calif., Toronto, Ont.

ZENITH

Are YOU Building Up Good Will  
with the

**ZENITH**  
CARBURETOR

completely equipped, tested and with proper setting, for quick and easy installation on 86% of all registered cars. Each outfit comes carefully packed in an individual box with full installation instructions.

Auburn .....	\$18.50	Maxwell .....	\$16.50
Cadillac 51-57 .....	45.00	Moon .....	18.50
Cadillac 59-61 .....	75.00	Oakland 6-54 .....	17.50
Chevrolet 490 .....	15.00	Oldsmobile 1923-5 .....	15.00
Chevrolet K .....	15.00	Oldsmobile 1926 .....	19.00
Chrysler 4 .....	16.50	Overland 4 .....	16.00
Chrysler 6 .....	32.50	Overland 6 .....	15.50
Cleveland .....	18.25	Packard 116-126 .....	45.00
Columbia .....	18.50	Packard Truck .....	50.00
Davis .....	18.50	Reo 6 .....	23.50
Dodge .....	20.00	Reo Speed Wagon .....	16.50
Durant A-22 .....	15.00	Star .....	16.50
Essex 6 .....	24.00	Studebaker Light 6 .....	15.00
Elcar .....	18.50	Studebaker Standard 6 .....	16.00
Flint 40 .....	16.50	Studebaker Special 6 .....	28.50
Ford .....	12.50	Studebaker Big 6 .....	30.55
Gardner 4 .....	15.00	White G O & G N .....	27.50
Gray .....	16.00	White G K .....	27.50
Hudson .....	24.00	White G E C .....	31.50
Hudson Dual .....	60.00	White G M .....	29.50
Hupmobile R .....	15.00	White G A .....	29.00
Mack A B .....	37.50	Willys-Knight 4 .....	20.50
Mack A C .....	40.00	Willys-Knight 6 .....	23.00

*Prices subject to change without notice.*

The Zenith Carburetor builds good will because of its dependability—the increased enjoyment which comes to the driver of a Zenith-equipped car.

These Special Outfits make it easy for the dealer to supply Zenith carburetion to his trade. There are no special changes required. *There is a Zenith for every make of car or truck.*

*Write for special descriptive literature and dealer's proposition.*

## ZENITH-DETROIT CORPORATION

Branches:  
NEW YORK  
CLEVELAND  
CHICAGO

Manufacturer of  
**ZENITH CARBURETORS**  
Over 1200 Service Stations

MAIN OFFICE  
and FACTORY  
DETROIT  
MICHIGAN



# Now you can



## You know these two classes of Tire Customers

1. Those who want a tire at \$20 for 20,000 miles.
2. Those who want a tire at \$10 for 10,000 miles.

Your PROBLEM, heretofore, has been to satisfy the customers in Class 2 with higher quality at lower prices.

NOW—you can do it and do it RIGHT.

MURRAY TIRES take care of the 1st.

MURRUCO TIRES take care of the rest.

For nine months we have been working on this new tire. We could have put it on the market earlier, but we wanted to give it every possible test—in the laboratory, in the factory and under every road condition, before admitting it to the MURRAY Family. MURRUCO came through with flying colors.

It is worthy of the MURRAY Name.

MURRAY RUBBER COMPANY, Trenton, New Jersey

# sell Both!

## MURRUCO CORDS

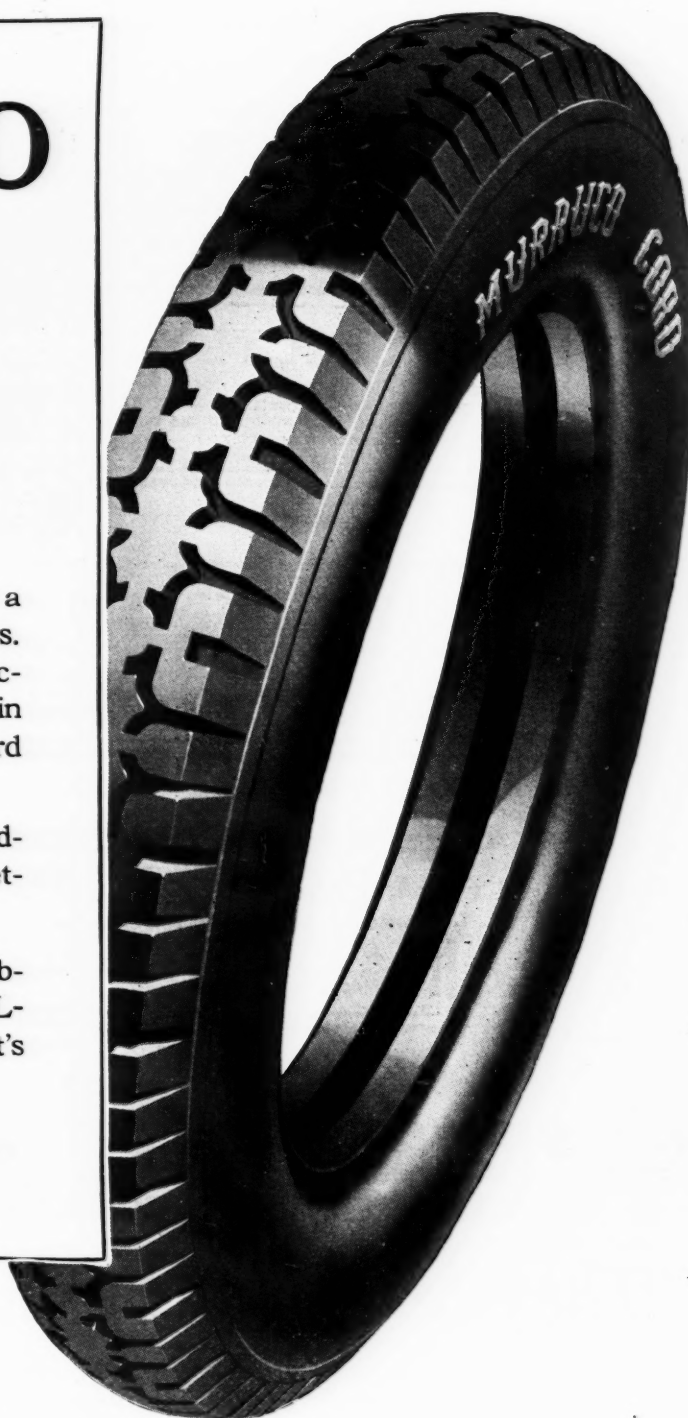
Satisfy the demand for a  
**QUALITY** Tire at a **LOWER**  
initial cost and unusually  
**LOWER** cost per mile.

MURRUCO CORDS are offered you in a complete line of High Pressure and Balloons. Full oversized; full ply standard construction; raised flat tread; guaranteed fully in accordance with manufacturer's standard warranty.

MURRUCO upholds the MURRAY standard for **QUALITY**—at the same time meeting the demand of the trade for price.

Your long-hoped-for answer to your problem of how to sell more real tire **QUALITY** at the lower price range has come—it's MURRUCO.

*Write today for full details of MURRUCO  
and the MURRAY Franchise.*



**MURRAY RUBBER COMPANY, Trenton, New Jersey**

## MERIT

Ability to give *riding comfort* is shock absorber *merit*. WEED Levelizers control rebounds with positive smooth restraint.

## SATISFACTION

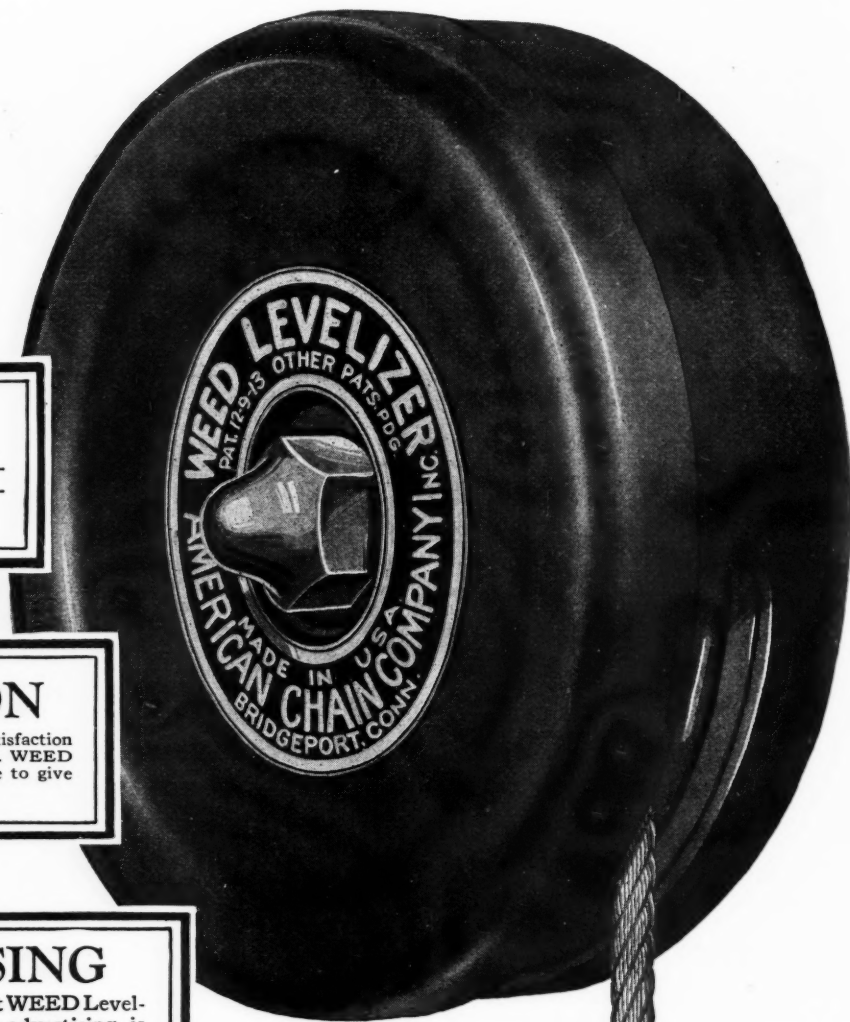
One time sales do not build a business. Satisfaction brings customers back for other accessories. WEED Levelizers stay sold because they continue to give *riding comfort* with minimum service.

## ADVERTISING

Motorists already know about WEED Levelizers. Extensive nation-wide advertising is your greatest selling help. WEED advertising is consistent and persevering.

## EASIER SALES

WEED Levelizers will sell easier because of their *merit, customer satisfaction and advertising*. If you are not selling them already, see your WEED jobber. Send for descriptive booklets, price lists, and further information.



# WEED Levelizers

"They level the road as you go"

Made and recommended  
by the makers of

WEED CHAINS and WEED BUMPERS

AMERICAN CHAIN  
COMPANY, Inc.  
BRIDGEPORT, CONNECTICUT

In Canada: Dominion Chain Co., Limited, Niagara Falls, Ont.  
District Sales Offices: Boston, Chicago, New York,  
Philadelphia, Pittsburgh, San Francisco





**S**ILENT wastes, illimitably vast. Mile upon mile without water or living thing. How vital to desert travel is the camel's silent endurance!

And how vital to the motor is the enduring silence which Celoron Silent Timing Gears bring to its timing mechanism! Quiet, resilient, they hush the grind and chatter of metal upon metal. Permanently true, they contribute mightily to that smooth, silent flow of effortless power which is the fruit of perfect timing.

Already their silence, their durability, their dependability has been built into motors numbered in the millions. Other millions of front-ends will be Celoron-equipped by repair shops and service men who have an eye to the increased profits that come with added customer good-will and the saving of installation time and labor. Ample stocks of Celoron Silent Timing Gears, maintained by N. A. P. A. distributors and jobbers at convenient points all over the country, ensure prompt deliveries.

### Diamond State Fibre Company

BRIDGEPORT, PA.

Paris, France

London, England

CHICAGO, ILL.

Diamond State Fibre Co. of Canada, Ltd., Toronto, Canada

# CELORON

## TIMING GEARS

*When at the Sesqui-Centennial,  
visit our Bridgeport, Pa., factory.  
Let us show you how Celoron and  
Diamond Fibre are manufactured.*

### Celoron Timing Gears Have These Distinct Advantages

1. Non-metallic; Eliminate metal-to-metal contact
2. Silent at all speeds
3. Stay silent permanently
4. Resilient; Save every part of the timing mechanism from the effects of vibration and shock
5. Prolong the life of shaft bearings
6. Accurately cut, they keep timing accurate
7. Maintain gas and oil economy
8. Prevent tear-downs
9. Grease-proof, oil-proof, water-proof
10. Will not warp or swell



*Flint is now ready to take its rightful place in the Industry. A new and aggressive organization back of this well-known product insures permanency.*

Flint has always been known for its mechanical superiority. It has always been known for motor car beauty. Mechanical features, such as the seven-bearing crankshaft, and other notable advancements brought fame to the Flint name.

And now, with a strengthened and worthwhile sales policy behind a line of cars which are *competitive in value, and priced right*, the Flint franchise becomes a valuable one to the automobile merchant of vision.

FLINT JUNIOR    •    FLINT SIXTY    •    FLINT EIGHTY

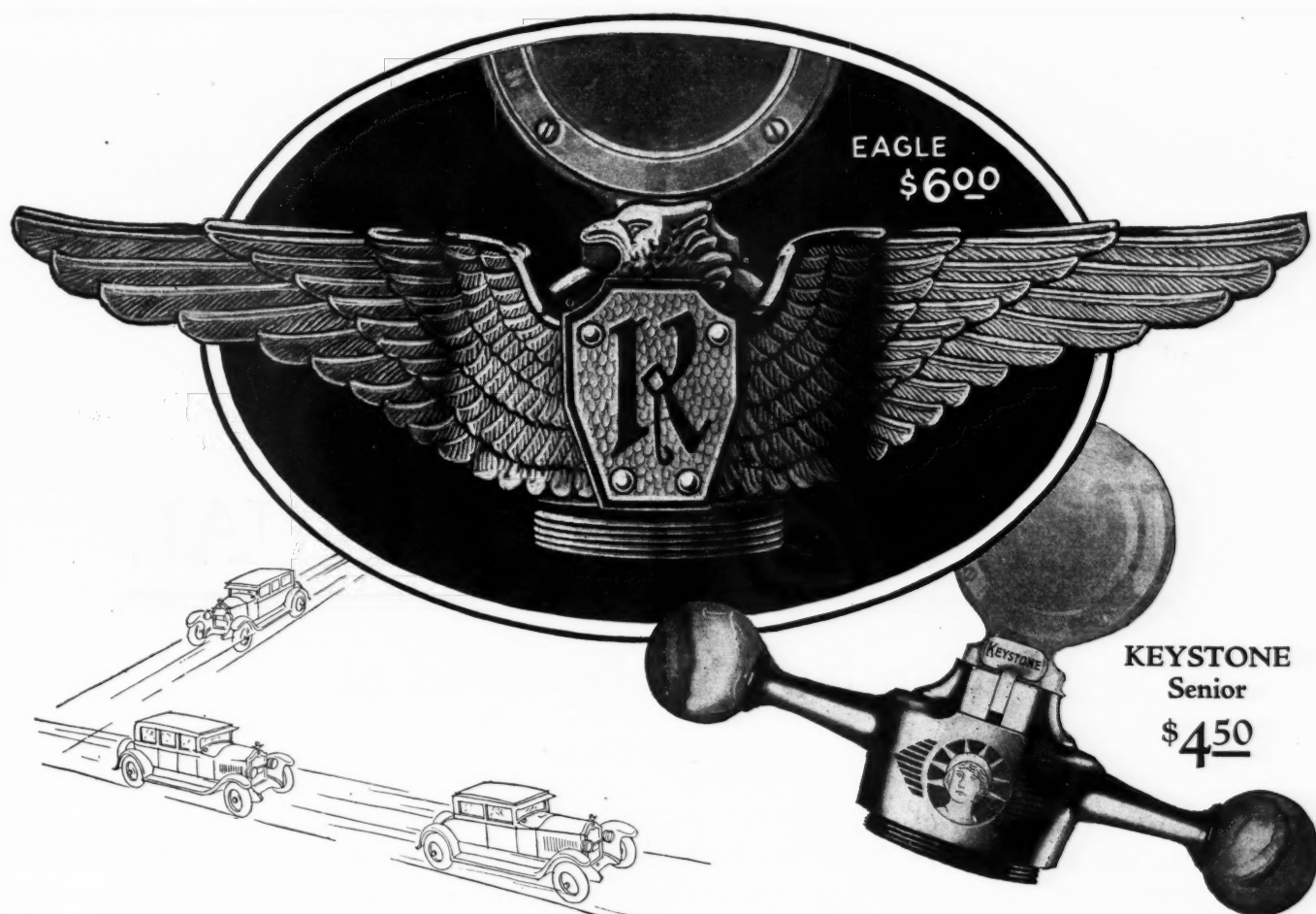
\$1085 to \$2395

*f. o. b.*

FLINT MOTOR COMPANY  
DURANT MOTOR COMPANY OF NEW JERSEY  
Elizabeth, New Jersey

General Sales Department    •    1819 Broadway  
Manufacturers Trust Company Building  
NEW YORK





## THIS IS A KEYSTONE YEAR

[With apologies to Studebaker]

OUR friends in South Bend phrased the thoughts of thousands of KEYSTONE dealers. Sales of the ball-end bar-type KEYSTONE Cap, as well as the EAGLE and EAGLET have been mounting rapidly ever since the year began.

Car owners understand KEYSTONE popularity. The absolutely theft-proof, rust-proof and other proven mechanical features make sure ample protection and satisfaction.

Car owners are also convinced that KEY-

STONE is the best looking Cap made. That is why more and more cars are leaving the dealer's show rooms with KEYSTONE Caps to complement their beauty.

KEYSTONE Caps are available in two sizes and three styles. The SENIOR and JUNIOR, ball-end bar-type Cap; the EAGLE and EAGLET, most popular of wing type Caps, and the Senior and Junior DeLuxe Cap, with genuine Onyx Balls are all made to fit any car.

Ask Your Jobber About KEYSTONE CAPS

THE NORLIPP COMPANY

546 West Congress Street • Chicago



Your Jobber will supply  
this Display Stand

# KEYSTONE

SELF-LOCKING

# RADIATOR CAPS



Extra Copies of the  
**MOTOR AGE**  
1926  
**FLAT RATE MANUAL**

---

Can Now Be Secured at

*50c Per Copy*

An extra supply of the MOTOR AGE Flat Rate Manual which appeared in the May 6, 1926, issue has been printed and is now available to Distributors, Dealers, Trade Associations, Schools, etc., who desire extra quantities.

— *First order received calls for 50 copies* —

"Motor Age,  
Chicago, Ill.

May 10, 1926

Gentlemen:

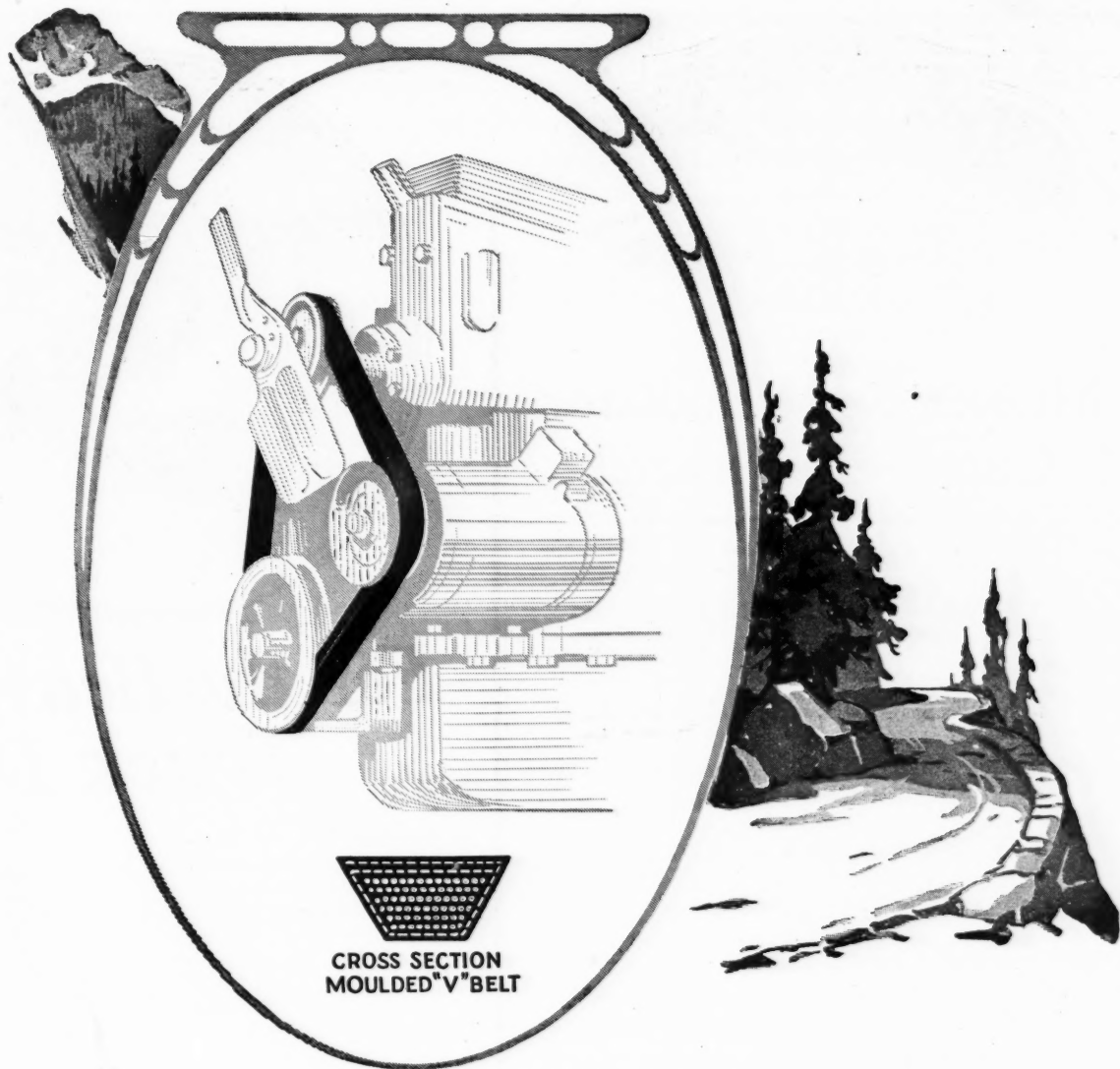
Your issue of May Sixth has just reached us and we want to congratulate you on its appearance and the wealth of extremely valuable material that it contains.

Among the many things that appeal to us is the new flat rate manual. We hope that you are planning to publish this in pamphlet form, so that copies will be available for distribution among garages. We are called upon for data of this kind continually and can use fifty of these to excellent advantage if they will be available."

Please address all orders or inquiries pertaining to this Flat Rate Manual to:—

**MOTOR AGE**

Subscribers' Service Dept.—5 So. Wabash Avenue  
Chicago, Ill.



CROSS SECTION  
MOULDED "V" BELT

Lift the hood of the car that drives up with a hot engine—4 times out of 5 you'll find the fan belt slipping. Replace it with the belt that really grips the pulley—the Gates Vulco. A nice profit for you—real service to your customers.

# GATES VULCO BELTS

*"The Standardized Fan Belt"*



## MONOGRAM Radiator Caps—Everywhere!

### FIVE REASONS WHY:

Count the MONOGRAM Self-Locking Radiator Caps on the cars that pass. What you see will prove to you that

- 1st MONOGRAM Radiator Caps are the National Preference.
- 2nd MONOGRAM National Advertising is effective advertising and is backed by a sound and fair sales policy.
- 3rd MONOGRAM Radiator Caps advertise themselves.
- 4th MONOGRAM Caps are good sellers, do not require a large stock and are easily and quickly installed by anyone.
- 5th The MONOGRAM line is a profitable line for you.

*Three models from which to choose*

### MONOGRAM

#### Onyx Locking Gear Shift Balls

MONOGRAM Locking Onyx Gear Shift Ball is made of genuine Mexican Onyx and locks on the gear shift rod, preventing theft. This ball comes in a handsome display carton containing twelve balls in assorted colors, with bushings.

### MONOGRAM

#### Onyx Illuminated Gear Shift Balls

This beautiful gear shift ball is made of translucent Mexican Onyx. It is equipped with flexible cord, colored bulb (to suit) and self-contained switch.

*Write for the Kingsley-Miller literature describing the Standard, Royal Onyx and Wing MONOGRAM Radiator Caps and MONOGRAM Gear Shift Balls.*

## MONOGRAM ORIGINAL Self Locking Radiator Cap

THE KINGSLEY-MILLER COMPANY  
600 West Jackson Boulevard Chicago, Illinois

*This is the fourth of a series of advertisements in trade papers and the Saturday Evening Post featuring MONOGRAM Radiator Caps on well-known cars.*



## For the Heaviest Truck Duty

Genuine Walden-Worcester Socket Wrenches with fixed handles designed for use on trucks, buses, tractors. A combination of brute strength and perfected design. Weight of the wrench illustrated is 9 lbs., 7 oz.—an indication to all mechanics of a wrench no nut can resist. Chrome nickel sockets in the smaller sizes.

Sockets grip the nut on all sides, eliminating distortion. And the

sockets are deep, providing clearance where the bolt extends through the nut. Outside diameters held down as far as possible.

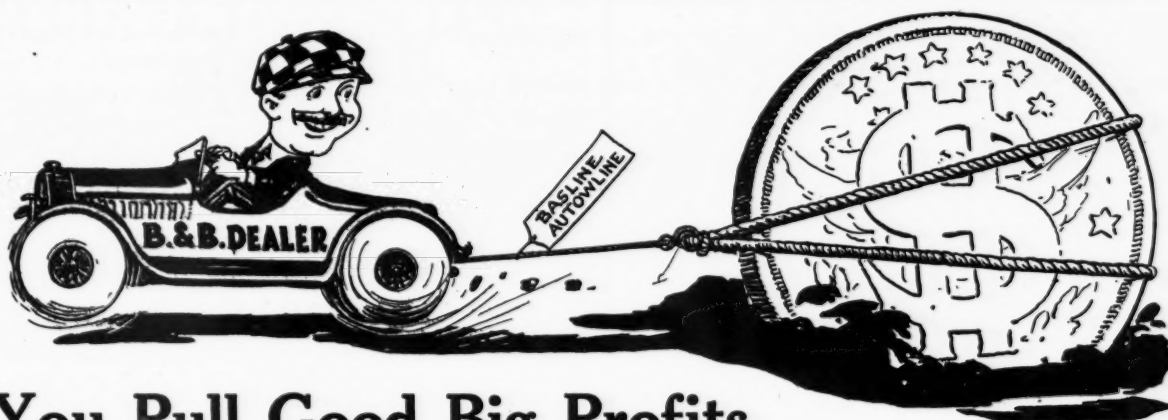
28 sizes, the smallest carrying a 7/16" socket, the largest, a 2" socket. The Walden-Worcester catalog (No. 50) containing the Walden-Worcester size chart is sent free to all who write for it.



Ask your jobber's salesman about this series (No. 4200) for trucks or buses.

**WALDEN-WORCESTER**  
*The original and largest exclusive manufacturers of All Steel Socket Wrenches in the World*  
475 SHREWSBURY ST., WORCESTER, MASS., U. S. A.





## You Pull Good Big Profits With BASLINE AUTOWLINE

In view of the established quality and reputation of BASLINE AUTOWLINE, it ought to sell for more than any other line on the market. But in order to further stimulate the present large sales of this *Original* wire rope towline, we reduced the prices to the trade last season.



Jobbers and Dealers write today for our Price List and Descriptive Literature. Then you'll realize that you can make some real money pushing this well-known, *absolutely-dependable* towline, the towline of exceptional *proved strength*.

**BRODERICK & BASCOM ROPE CO., ST. LOUIS**

Eastern Office and Warehouse: 76 Warren Street, New York City

J340

## *Industrial Bond Issues*

**WE** are prepared to purchase entire bond issues of sizeable and sound American industrial and manufacturing companies.

*Address our office  
at  
42 Broadway, New York City*

## **HORNBLOWER & WEEKS**

ESTABLISHED 1888

BOSTON  
DETROIT

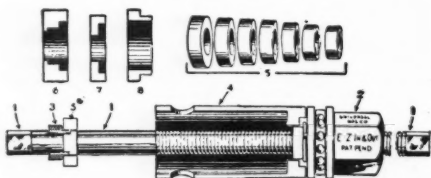
NEW YORK  
PROVIDENCE

CHICAGO  
PORTLAND, ME.

CLEVELAND  
PITTSBURGH

## E-Z IN AND OUT UNIVERSAL BUSHING TOOL

Approved and used as standard equipment by leading car and truck manufacturers.



The E-Z In and Out Bushing Tool is the only universal tool that Removes and Replaces practically all bushings on any car or truck without tearing down the car. It is a powerful hand press which develops 5 tons against the ball thrust bearing. Pulls and replaces bushings in good condition. Saves reaming. Saves Time and Hard Work.



Made in Four Sets

- |  |        |
|--|--------|
| No. 25 For bushings from 9/16" I.D. to 1 1/8" O.D.           | \$7.50 |
| No. 50 For bushings from 3/4" I.D. to 1 5/8" O.D.            | 17.50  |
| No. 75 For all bushings on Ford car.                         | 17.25  |
| No. 80 Lincoln Special (including front axle Timken bearing) | 17.50  |

Send for descriptive literature. If your Jobber does not carry them order direct from us.

**UNIVERSAL MANUFACTURING CO.**  
1637 Madison Ave., SE, Grand Rapids, Mich.

## DEALERS — GARAGEMEN

USED CAR DEALERS,  
CAR WRECKERS,  
AUTO SUPPLY STORES,  
FLEET OWNERS,  
REPAIR SHOPS—



## GET OUR BIG 80-PAGE CATALOG

Everything listed at cut prices—less than regular wholesale. Quantity purchases make our low prices possible. Nationally advertised products. All new except where specified—Timken Axles and Bearings—Standard Timing Gears—Brown-Lipe Transmissions—Pistons—Rings—Hayes and Firestone Wheels—Rims—Tires—Tubes—also a complete line of accessories.

Write for our big new 80-page Wholesale Catalog today!

**Warshawsky & Company**

World's Largest Replacement Parts House  
1915-35 So. State St., Dept. MA-8, Chicago, Ill.

## Your Ford Won't Boil



with the  
**G.B. Impeller**

Here is a fan—scientifically designed to surpass anything yet manufactured.

**Keeps the Ford engine Cool on the hottest day no matter how hard you run it over the country taking grades and hills.**

The G. B. IMPELLER insures smooth running of your car and proper operation of

the Ford Thermo syphon cooling system. Cools the car better than a water pump and does away with the need of one.

Reduces evaporation and cuts down replenishing water in radiator about 50%.

Increases efficiency and life of your Ford.

Saves Gas and diminishes repair bills.

Installed in a few minutes by any one. Just remove the regular fan and put on the Impeller. It fits exactly. Nothing to get out of order. No special tools required.

Retail  
Price  
**\$3.00**

### UNLIMITED GUARANTEE

Send in your order today. Should you not get satisfaction after 10 days trial, return the Impeller to us collect and we will refund the money.

Regular Trade Discounts Made

Agents Wanted

**DE BOTHEZAT IMPELLER CO., INC.**  
1920 Park Avenue New York City, N. Y.

*In the next issue of*

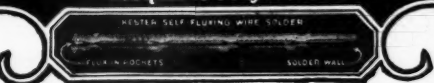
# MOTOR AGE

there may be a new  
idea that will mean  
many dollars of  
profit to you . .

*Don't miss it!*

# KESTER Self Fluxing SOLDER

Simple, Safe and Sure  
Requires Only Heat



## KESTER Acid Core SOLDER

For general soldering and heavier electrical work. Self Fluxing—"Requires Only Heat." Standard size No. 3 about 1/8 inch in diameter, runs about 30 feet per pound. Packed on 1, 5 and 10 pound spools. Special gauges also available.



## Kester Metal Mender The Household Solder

Here is the small package of Acid Core Solder. So simple anybody can use it. Ten cans about 1/4 pound each are packed per carton. Ten cartons (100 cans) to the case lot.



## Kester Rosin Core Solder

For very delicate electrical and radio work. Contains highest quality metals and rosin flux. Standard size about 3/32 inch in diameter, runs about 50 feet per pound. Packed on 1, 5 and 10 pound spools and 18 inch sticks in 5 pound boxes. Special gauges also available.



## Kester Radio Solder (Rosin Core)

Safe, Sure and Simple—approved by radio engineers. Harmless to the most delicate parts. Absolutely non-corrosive flux makes low-loss joints. Ten cans about 1/4 pound each per carton. Ten cartons (100 cans) to the case lot.

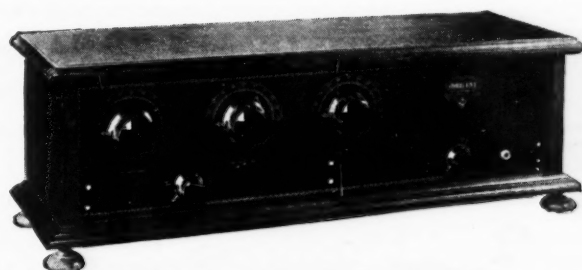
GENUINE SOLDER

**CHICAGO SOLDER COMPANY**

4203 Wrightwood Avenue, Chicago, U. S. A.

Originators and world's largest  
manufacturers of Self Fluxing Solder

Your Jobber Can Supply You



## AMAZING NEW KIND OF RADIO SET

*Gets Stations From 40 to 550  
Meters—Local and Foreign*

The Ambu-5 is taking the country by storm. It gets programs from 40 meters to 550 meters—coast to coast. Amateur, experimental, and foreign stations can be received by the Ambu-5 in addition to all the regular stations. It has great power and is ultra-selective. Its tone has never been equaled.

**This Special Feature Makes the  
AMBU-5 Different**



Look at this picture—it is the sub-panel of the Ambu-5. The entire circuit is directly imbedded in the sub-panel, in one continuous piece. Connections are solid and rigid—jarring or vibration can do no harm. No chance for loose or corroded connections. The construction is so fool-proof that service problems are eliminated. The imbedded circuit is the year's greatest improvement in radio set construction. The patent is controlled by Ambu Engineering Institute.

## Big Business Opportunity! NO INVESTMENT

Here is a wonderful opportunity for you to make from \$70 to \$250 extra profits every week in the radio business with a set that has struck the public fancy. Hundreds of garages, tire and accessory shops, battery and service stations are doing a tremendous business under the Ambu plan which requires no investment in stocks and supplies. All you need is a demonstrator set. Some territories still open.

## From Factory to Dealer— No Jobbers—No Middlemen!

The Ambu plan eliminates the jobber and wholesaler. You buy at jobber prices and make two profits. Here is a quick, easy way to make big profits without a big investment. Send in the coupon for our special sales plan.

**MAIL THIS COUPON TODAY!**

**AMBU ENGINEERING INSTITUTE**

*Established Since 1919*

2630-F Prairie Avenue, CHICAGO, ILLINOIS

Send me free, complete information and prices and tell me how I can make big money in radio as dealer without big investment in stock.

NAME.....

ADDRESS.....

CITY.....

STATE.....

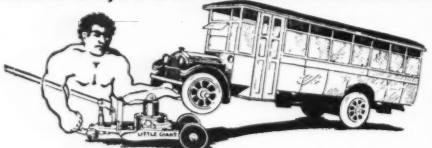
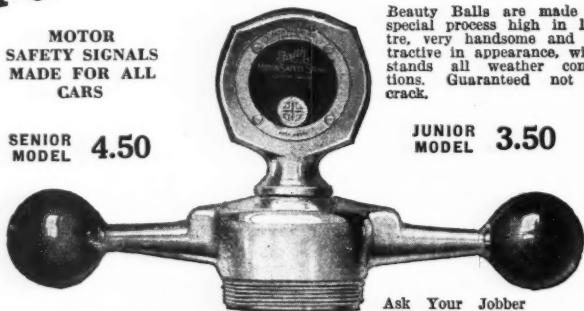
BUSINESS.....

☐ Check here if interested in Radio Course.



**IMPROVED HYDRAULIC JACK**

Trucks and busses are easily and safely handled.

**The LITTLE GIANT**  
Lifts 24,000 lbs. With One HandStarts and stops at any point.  
LIFT 7 1/2".  
BASE 11 1/2 x 30".  
Lowered by touch of a valve.  
JUST LET US SEND YOU A COMPLETE DESCRIPTION OF THIS WONDER JACKWrite **STANDARD EQUIPMENT CO.**  
Hales Corners, Wisconsin**Faith BEAUTY BALL LOCKING CAP**  
FOR ALL MODEL CARSMOTOR  
SAFETY SIGNALS  
MADE FOR ALL  
CARSSENIOR  
MODEL 4.50JUNIOR  
MODEL 3.50

Ask Your Jobber

**FAITH MFG. CO., 2539 N. Ashland Ave., Chicago, Ill.**

Beauty Balls are made by special process high in lustre, very handsome and attractive in appearance, withstands all weather conditions. Guaranteed not to crack.

**MORRISON**  
Automatic Double Range**Worm Drive JACKS**Special model  
for Balloons

Can't Slip or Tilt

Flexible steel "Sure Hold" cap prevents dangerous slipping. Long folding handle (36 to 72 in.) operates from standing position. Gets under overhanging bodies. Easy to work. Few turns and it's up. Built in 11 sizes for all service requirements up to 8 tons. Furnished as standard equipment on fine passenger cars, trucks, buses and Fire Apparatus for past 4 years. The Jack for YOUR shop. Write for sample for test.

**THE WOODS ENGINEERING CO., Alliance, Ohio**  
General Sales Representatives for Canada, carrying branch warehouse stock:  
**Colonial Traders, Ltd., Chatham, Ontario, Canada.****KISSEL**

CUSTOM BUILT

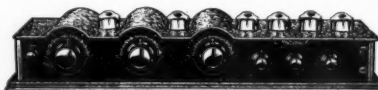
**Kissel Motor Car Co., Hartford, Wis.****Glareproof**  
AUTO MIRROR*"Write Your Own Guarantee"***SPEE-DEE CLEANS UP**  
for Dealers

Results in quick stock turn-over, with small investment and liberal profits. Without water it removes grease, stains, etc., from hands, cloths, upholstery, paint or enamel. Indispensable in shops, service stations and car kits. List 35c.

Write for discount details.

**States Chemical Company**  
703 W. Fulton St. Chicago, Ill.The profitable line  
that moves fast**FULTON**Accelerator for Fords  
— Pedal Pads for  
Fords and all cars—  
Accelerator Pedal forall cars — Aermore  
Exhaust Horn—Hud-  
son's Crankcase Re-pair Arm for Fords—  
Copperhead Socket  
Wrench, etc.**The Fulton Company, 732—75th Ave., Milwaukee****WATERVLIET SPIRAL EXPANSION**  
ALIGNING REAMERSMake piston pins FIT  
WILL NOT CHATTERAsk your Jobber  
or Write for Literature**Watervliet Tool Co., Inc.**

1037 Broadway, Albany, N. Y.

New York: 1780 Broadway; Kansas City: 711 Mutual Bldg.;  
San Francisco, 661 Turk St.**Neutrowound****SUPER-POWER**  
RADIOWrite for Exclusive Ter-  
ritory proposition to Sub-  
Distributors.**Neutrowound Radio**  
Mfg. Co.

Homewood, Ill.

Radio Division

Advance Automobile Accessories Corp.

**Simplicity**

REBORER AND GRINDER

A big money-maker in any automobile repair shop or garage. Ask for free demonstration in your own shop.

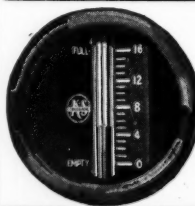
Port Washington,

**Simplicity Manufacturing Company**

Wisconsin

**BRUNNER**  
AIR COMPRESSORS  
**FREE**Write for the Book  
"AIR PROFITS"

describing many new uses for compressed air. Shows how to make an air compressor earn greater profits.

**BRUNNER MFG. CO.**  
UTICA NEW YORK**The K-S GASOLINE**  
Telegage

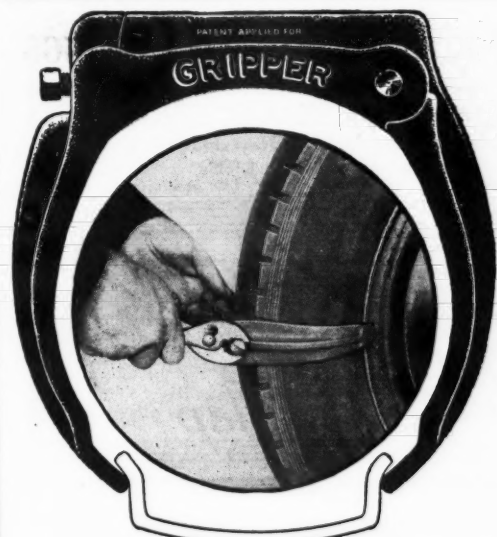
A gasoline gauge on the Dash. Note our half page advertisement in this week's issue Saturday Evening Post. Write for description and proposition to the trade.

**KING-SEELEY CORPORATION**298 Second Street, Ann Arbor, Mich.  
Chicago Branch: 2450 Michigan Blvd.**The Original**  
**Bosch**

Franchise details for selling ORIGINAL BOSCH Automotive Equipment will be sent to any Distributor, Dealer or Service Station on request.

**ROBERT BOSCH MAGNETO CO., Inc.**  
109 West 64th Street New York, N. Y.

ORIGINAL BOSCH units bear the full name, Robert Bosch, and the trade mark shown at left. These are the identifications of Bosch quality—famous since 1887.



GRIPPERS are simple and easy to apply even when wheels are up to the hubs in trouble

## A NEW BIG SELLER! GRIPPERS

### For Emergency Pulling Out

Grippers bring back traction. When wheels are spinning in bottomless roads, drivers install them, and cars pull out under their own power. They are entirely for emergency use. Nothing can displace them. That's why they are so easy to sell.

Write for complete details.

**GRIPPER MFG. COMPANY**  
536 Lake Shore Drive Chicago, Ill.



## THE BEARINGS COMPANY OF AMERICA Lancaster, Penna.

Manufacturers of Angular Contact Thrust Bearings, Angular Contact Radial Bearings, and Thrust Ball Bearings of all types.

Supplied to your blueprints and exact requirements.

Western Sales Office  
1012 Ford Bldg.  
Detroit, Mich.

## FOLLETT'S NEW MODEL TIME STAMP

accounts for every labor minute



Learn the interesting details from our descriptive data.

Prints the year, month, day, hour, minute, A.M. or P.M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM

Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Every machine guaranteed.

Follett Time Recording Co., 217 High Street, Newark, N. J.  
"Established Since 1904"



## ELECTRIC "SPEED-SPRA" Original MECHANICAL WASHER

## WRITE TODAY

for descriptive literature and price on our

New 1 Gun 2 Man

## Electric "SPEED-SPRA"

Auto laundries, garages, paint shops, car dealers and fleet owners, who did not have enough work to keep our larger 2 Gun "Speed-Spra" busy at all times, have welcomed with enthusiasm our announcement that our 1 Gun 2 Man "Speed-Spra" was ready for delivery.

This smaller, yet highly efficient and rapid washing unit, is so low in price that any wash rack owner can quickly pay for it out of increased profits alone.

Get all facts, illustrated descriptive literature and prices today. Find out how easy it is to lower wash rack costs and raise wash rack profits.

**Hayes Pump & Planter Company**

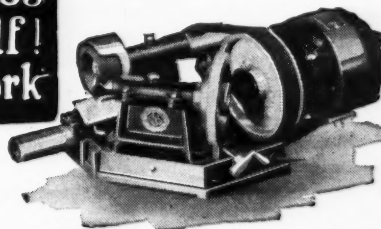
819 Sixth St.,

Dept. 19,

Galva, Ill.

**"KEEP THE WASH RACK BUSY !!"**

## Costs Less than Half! Better Work



## CROWE CUP WHEEL VALVE REFACER

Price Only

**\$87.50**

Complete

**EASY TERMS**

THE astonishingly low price of this machine puts it within the reach of every auto repair shop. The big shop can give better service with the Crowe. And with this machine the small shop is fully equipped to give the same high grade valve service as the big shop.

But aside from its money-saving price, the Crowe has many special features that make it preferable.

We would like an opportunity to give you the complete details of this improved valve face grinder, and our easy payment plan. Money back guarantee. Will you write us today for this information?

**LISLE MANUFACTURING COMPANY**

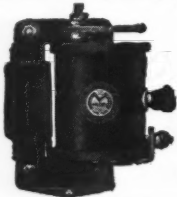
Box C,

CLARINDA, IOWA



# FISK TIRES

There's a Fisk Tire of extra value in every size,  
for car, truck or speed wagon



**Mallory**  
Ignition Coil

Has two primary windings instead of one. Gives a hotter spark, makes easier starting, gives more power, quicker pickup and more mileage. Try it on a sluggish motor. Write for full particulars.

The Mallory Electric Corporation, Toledo, Ohio.

**PROTECTOMOTOR**  
REG. U.S. PAT. OFF.  
Perfect Positive Protection

Filters all dust, sand and grit out of air supply to carburetor and motor. Write us for facts.

STAYNEW FILTER CORPORATION  
Rochester, N. Y.

**99 9/10**  
EFFICIENT



Prevent  
This

**Stops Pump Shaft Leaks  
Immediately and Permanently**  
Conneaut Plastic Metallic Packing molds in the fingers to fit stuffing-boxes of any size or shape. It is a repair for the worn shaft and loose bushing. At your jobbers; if not write us.  
1 lb. can. \$1.75 per pound  
5 lb. can. \$1.60 per pound

**THE CONNEAUT PACKING CO.**  
Conneaut, Ohio



Let us  
send our  
profit-  
boosting  
plan.  
It's Free.



**QUALITY—PROFIT—TURNOVER**  
**American  
Hammered  
Piston Rings**

American Hammered Piston Ring Company  
Baltimore, Maryland

**Grey-lock** **THE PERFECT BRAKE  
LINING**

See announcement of complete advertising and sales plans in the September 2nd issue of Motor Age.

United States Asbestos Company  
Manheim, Penna.

**LIKUM** Alarm **LOCK**  
Ignition

TYPE A  
\$5.00

Locks ignition and sounds  
horn if tampered with

TYPE B  
\$7.00

**LOOMIS - KNIGHT - MILLER, Inc.**  
SPRINGFIELD - MASSACHUSETTS



**WESTINGHOUSE AIR SPRINGS**

The finest known method of shock absorption  
**THE WESTINGHOUSE AIR SPRING CO.**

Factory and General Offices, New Haven, Conn.  
New York Chicago Boston Philadelphia Los Angeles Cleveland Atlanta

**ELIMINATES SLOW LEAKS**

—from rusted clincher rims. An endless piece of specially compounded rubber. Snaps on rim like rubber band. Fits snug all around. Prevents tube touching rusted rim. One size fits all clincher rims. Write for discounts.

LAENG MFG. CO., 3722 Lorain Ave., Cleveland, O.  
25 Beaver St., New York City

**Laeng**  
Clincher Rim Flap



Transmissions  
and Clutches

FOR  
**BROWN-LIFE  
GEAR CO.**

Trucks, Busses  
Passenger Cars

QUICK SERVICE ON COMPLETE UNITS OR PARTS

**BROWN-LIFE GEAR CO.**  
SYRACUSE, N. Y.



**Prest-O-Lite**

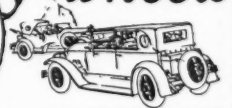
Automobile and Radio Batteries  
Write for our interesting dealer proposition.  
It means bigger profits for you.  
The Prest-O-Lite Co., Inc., Indianapolis, Ind.



Curtis Pneumatic  
Machinery Co.

1957 Kienlen Ave.  
St. Louis, Mo.

**Good bye, buggy wheels**



Budd Wheel Company

Detroit—Philadelphia

**TIMKEN**  
**Tapered**  
**ROLLER BEARINGS**

Two Hones in One

**HALL HONE**

**\$35.**  
at your  
Jobber's

Solid Pressure — Spring Pressure





### Red Cat Heaters

Red hot winter profit item. More heat—less cost. Makes a hit with car owners. Made for Ford, Dodge, Overland, Star, Chevrolet, Hudson and Essex cars. See your jobber.

G. A. ROTH MFG. CO., Hastings, Neb.

## Kawneer

SOLID COPPER  
STORE FRONTS

Write for Special Book Garage Fronts  
THE KAWNEER CO., 3724 Front St., Niles, Mich.



### Guaranteed Unbreakable Gear Shift Ball

Made in all combinations from 11 basic colors. Packed 18 in attractive counter display box. Counter display cards also furnished. Complete with all necessary bushings. 2 in. in diameter. Highly polished. Fast seller. Price \$1.25. Write for details and catalog of entire line of 12 items. Order from your jobber or direct.

RAINBO ACCESSORIES COMPANY  
1420 S. Michigan Ave., Chicago, Ill.



### Valve Face Grinding Machine

Get a demonstration of Sioux before you buy any valve grinding machine. GUARANTEED FOR A LIFETIME.

Your Jobber Sells It

ALBERTSON & CO.  
Sioux City, Ia.



### So-Lo Jack Co., Inc.

Attleboro Mass.  
Sales Office  
108 Massachusetts Ave.  
Boston Mass.

Cash in on This Profit Maker!

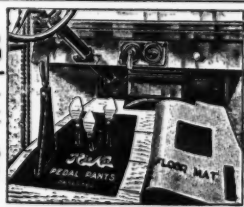
### RieNie PEDAL PANTS

Keeps cold air from whizzing through floor openings in Fords, Chevrolets, Dodges, Stars, Grays, Overland Fours. A sure-fire hit when the thermometer drops.

Sells quickly — adjusts without tools — big profits.

Ask your jobber today.

DURKEE ATWOOD CO.  
MINNEAPOLIS, U.S.A.



The tire with the Gum Weld Cushion has become the most favorably talked about heavy-duty tire in America.

So it pays to be an INDIA dealer.

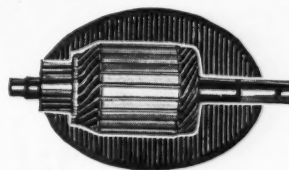
INDIA TIRE & RUBBER CO., AKRON, OHIO



## "As Silent as a Shadow" Quincy Compressors

Quincy, Illinois

J-538



### FREDERICKS Rewinding Service

New Rewind Profits—See announcement every 4th week. Write now for price list. The H. M. Fredericks Co., Lock Haven, Pa.

## New Type PERFECTION MOTOR CAR HEATERS \$5 to \$8

### Gemco BUMPERS

Tempered and nickel plated by our own exclusive process. Maximum strength, lasting beauty of finish. Write for catalog.

760 S. Pierce St. Milwaukee, Wis.



### TASCO Gas Gauge for FORD CHEVROLET OVERLAND and STAR



Sells Quick at \$1.25 Retail. Types "K" and "J" for 1926 Chevrolets and all Stars Sell at \$1.50

THE AKRON-SELLE CO.  
Akron, Ohio

### CLASSIFIED ADVERTISING

#### PARTS

#### AUTO PARTS

SAVES 50% TO 75% ON ALL CARS

New and Used Gears—Springs and Axles—Cylinders—Motors—Rear Systems, etc. Wire or Write

INDIANA AUTO PARTS CO.  
608-10 N. CAPITOL AVE., INDIANAPOLIS, IND.  
LARGEST CAR WRECKERS IN INDIANA

#### HOUSE OF A MILLION AUTO PARTS

The largest stock of new and used car and truck parts in the world. We have everything. Always mention model and serial number in order. Write us. All inquiries answered promptly.

DOUGLAS AUTO PARTS CO., INC.  
2803-S-7-9 South State St., Chicago, Ill.

#### REPRESENTATION WANTED

WELL KNOWN BRITISH FIRM OF MOTOR ACCESSORY MANUFACTURERS HOLDING BRITISH CAR EQUIPMENT CONTRACTS WISHES TO TAKE UP SOLE AGENCIES FOR AMERICAN ACCESSORIES FOR BRITISH ISLES AND COLONIES. APPLY THE WILMOT MANUFACTURING CO., LTD., EASTERN WORKS, CAMDEN STREET, BIRMINGHAM, ENGLAND.

#### PATENTS & PATENT ATTORNEYS

#### C. L. PARKER

Ex-Examiner U. S. Patent Office  
Attorney-at-Law and Solicitor of Patents  
McGill Building, Washington, D. C.

Patent, Trade Mark and Copyright Law

#### BUSINESS OPPORTUNITIES

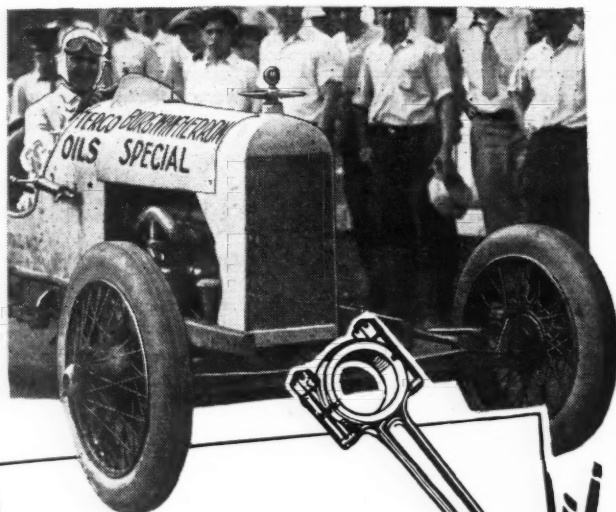
GOOD OPPORTUNITY FOR MEN OWNING CARS to purchase automobile bulbs to sell to gas stations and dealers. Attractive discounts. Address Box 6277, Motor Age, 5 S. Wabash Ave., Chicago, Ill.

For Sale—Garage on main highway. Show room 40x30—work room 30x60. Willys-Overland Agency. Good business in a good town. S. T. Fry, Oak Hill, Ohio.

If you don't find what you want here, your advertisement here will find it for you.

# CHAMPION

of the Half Mile Dirt Track



Watkins Rebabbitting Service,  
5706 Harvard Street,  
Pittsburgh, Pa.

Gentlemen:—

Attn. E. B. Rhodes.

The Watkins babitted conn. rods carried me to  
another victory on the Mcnongahela Half Mile Dirt Track  
Speedway on July 5th. My time for the 100 miles was  
One Hour and Fifty-Nine minutes FLAT.

This is the best record for that track since I  
lowered the Worlds Record on September 7th. 1925. At which  
time I also used Watkins rods.

During the several years that I have used your  
rods I have never had a bit of trouble.

Very truly yours,

*Lou Schimpff*

**Wins Record with WATKINS  
REBABBITTED CONNECTING RODS**

**WATKINS**  
*Complete* **REBABBITTING  
SERVICE**  
**HOME OFFICE  
WICHITA, KANSAS**

**NEW YORK**  
33 W. 60th St.

**PORTLAND**  
14th & Everett St.

**INDIANAPOLIS**  
19 W. South St.

**DENVER**  
1818 Blake St.

**HARTFORD**  
28 High St.

**OMAHA**  
1006 Douglas St.

## BRANCH OFFICES

**CHICAGO**

57-61 E. 24th St.

**WASHINGTON**  
1322 14th St. N. W.

**TOLEDO**  
1942 Putnam St.

**SEATTLE**  
725 E. Pine St.

**SYRACUSE**  
211 Wyoming St.

**PITTSBURGH**  
5706 Harvard St. E. E.

**LOS ANGELES**

2319 S. Hill St.

**MEMPHIS**  
278 Washington St.

**TORONTO, CAN.**  
122 Adelaide St. W.

**ST. LOUIS**  
4216 W. Easton Ave.

**CLEVELAND**  
5109 Euclid Ave.

**WATERLOO**  
N. E. East 4th St.

# Index to the

The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A. C. Spark Plug Co.....	55	Flint Motor Co.....	78
Advance Automobile Accessories Corp. ....	86	Follett Time Recording Co.....	87
Akron-Selle Company, The.....	89	Fredericks, H. M., Co.....	89
Albertson & Co.....	89	Fulton Company, The.....	86
Ambu Engineering Institute.....	85		
American Chain Co.....	76		
American Hammered Piston Ring Co. ....	88	Gates Rubber Co.....	81
		Gemco Mfg. Co.....	89
		Gripper Mfg. Company.....	87
Bearings Co. of America.....	87		
Blossom Lock Co., The.....	64	Hall Mfg. Co., The.....	88
Bosch, Robert, Magneto Co.....	86	Hayes Pump & Planter Co.....	87
Brewer-Titchener Corp., The .....	52 & 53	Hornblower & Weeks.....	83
Broderick & Bascom Rope Co. 83			
Brown-Lipe Gear Co.....	88		
Brunner Mfg. Co.....	86		
Budd Wheel Co.....	88		
		India Tire & Rubber Co.....	89
Cadillac Motor Car Co.....	47		
Chicago Solder Co.....	85		
Chrysler Sales Corp.....	8	James Motor Valve Co.....	56 & 57
Classified Advertising Section..	89		
Conneaut Packing Co.....	88		
Curtis Pneumatic Mach. Co.....	88		
		Kawneer Co., The.....	89
		King-Seeley Corp.....	86
De Bothezat Impeller Co., Inc. 84		Kingsley-Miller Co., The.....	82
Delta Electric Company.....	59	Kissel Motor Car Co.....	86
Diamond State Fibre Co.....	77		
Durant Motors, Inc.....	65 to 72		
Durkee-Atwood Co.....	89		
		Laeng Mfg. Co.....	88
		Larkin Automotive Part Co.....	88
		Liberty Mirror Works.....	86
Faith Mfg. Co.....	86	Lisle Mfg. Co.....	87
Fisk Tire Co., The.....	88	Loomis-Knight-Miller, Inc.....	88

# Advertisements

Hallory Electric Corp., The.....	88	Simplicity Mfg. Co.....	86
Manhattan Rubber Mfg. Co.,.....		So-Lo Jack Co., Inc.....	89
The .....	61	Standard Equipment Co.....	86
Manley Mfg. Co.....	2nd Cover	States Chemical Co.....	86
Murray Rubber Co.....	74 & 75	Staynew Filter Corp.....	88
		Studebaker Corp., The.....	5
		Stutz Motor Car Co.....	Front Cover

Nash Motors Co.....	6	Thomas Mfg. Co., W. H.....	51
Neutrowound Radio Mfg. Co.....	86	Thomson Mfg. Co.....	63
New Departure Mfg. Co.....	2	Timken Roller Bearing Co., The .....	88
No Rad Rust Corp.....	62	Tuthill Spring Co.....	3
Norlipp Company, The.....	79		
North East Electric Company..	54		

Olds Motor Works.....	49	U. S. Air Compressor Co., The .....	3rd Cover
		U. S. Asbestos Company.....	88
		U. S. Elec. Tool Co.....	60
		Universal Mfg. Company.....	84

Packard Electric Co., The .....	Back Cover
------------------------------------	------------

Perfection Heater & Mfg. Co. The .....	89
---	----

Prest-O-Lite Co., Inc., The.....	88
----------------------------------	----

Quincy Compressor Co.....	89	Walden-Worcester, Inc.....	82
---------------------------	----	----------------------------	----

		Walker Mfg. Co.....	50
		Warshawsky & Company.....	84
		Watkins Rebabbling Service, The .....	90
		Watervliet Tool Co., Inc.....	86
		Webber, P. H., Co.....	4
		Western Chain Co.....	7
		Westinghouse Air Spring Co.....	88

		Williams, J. H. & Co.....	92
--	--	---------------------------	----

Rainbo Accessories Co.....	89	Woods Engineering Co.....	86
----------------------------	----	---------------------------	----

Roth Mfg. Company, G. A.....	89	World Bestos Corp.....	58
------------------------------	----	------------------------	----

Shaler Co., C. A.....	91		
-----------------------	----	--	--

Sherwin-Williams Co.....	1	Zenith-Detroit Corp.....	73
--------------------------	---	--------------------------	----

## SHALER HEL-DUST A PENNY A PATCH



### No Other Way to VULCANIZE So Cheaply

With this new Shaler Hel-Dust Vulcanizer you can do a real vulcanizing job for a penny a patch—cheaper than even a temporary patch could be stuck on.

Designed expressly for garages, repair shops and fleet owners, it makes a long-cure repair (10 minutes)—and is always ready to use instantly to do a job the same as a steam or electric tube plate would do—without waiting for the tube plate to heat up.

Same patented principle as in Shaler 5-Minute Vulcanizers. But in the Hel-Dust Vulcanizer the vulcanizing pans or cups are made of heavy metal and are permanent instead of being thrown away after each job. Also the heat is supplied by Hel-Dust—a fuel that is powdered. Fuel and rubber cost the repairman only about a cent per repair.

The complete outfit, as illustrated, costs only \$6.00 (subject to trade discount). Ask your jobber's salesman, and write for our catalog of the complete line of Shaler Tire Repair Equipment.

C. A. SHALER CO., 2152 Fourth St., Waupun, Wis.  
World's Headquarters for Tire Repair Devices



# Sell Him a Set to Fit His Needs



*Many a motorist who asks for ONE wrench would buy a complete set. He simply doesn't know you carry sets to fit his needs.*

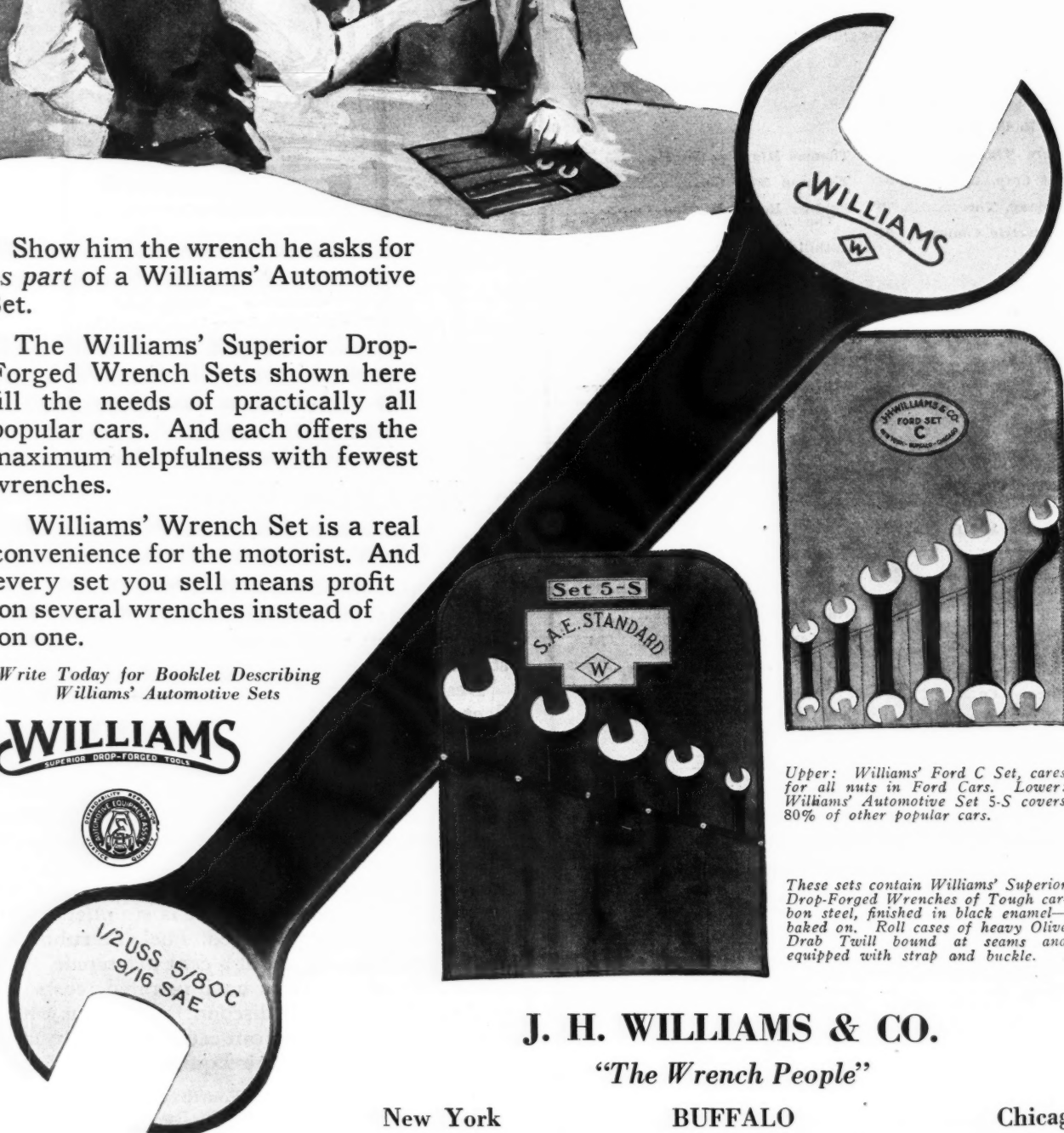
Show him the wrench he asks for as part of a Williams' Automotive Set.

The Williams' Superior Drop-Forged Wrench Sets shown here fill the needs of practically all popular cars. And each offers the maximum helpfulness with fewest wrenches.

Williams' Wrench Set is a real convenience for the motorist. And every set you sell means profit on several wrenches instead of on one.

Write Today for Booklet Describing Williams' Automotive Sets

**WILLIAMS**  
SUPERIOR DROP-FORGED TOOLS



Upper: Williams' Ford C Set, cares for all nuts in Ford Cars. Lower: Williams' Automotive Set 5-S covers 80% of other popular cars.

These sets contain Williams' Superior Drop-Forged Wrenches of Tough carbon steel, finished in black enamel—baked on. Roll cases of heavy Olive Drab Twill bound at seams and equipped with strap and buckle.

**J. H. WILLIAMS & CO.**

*"The Wrench People"*

New York

BUFFALO

Chicago

# U. S. SELF OILING CAR WASHING EQUIPMENT

No dirty oil or grease cups to worry about! No chance for grief or expense by neglecting or forgetting the daily or weekly oiling! The operator's greatest source of expense and worry absolutely eliminated.

Just a little careless neglect may lay up the old fashioned, expensive car washing outfit for costly and lengthy repairs. U. S. Car Washing Equipment requires practically no attention. You replenish the crank case oil occasionally, while the motor only requires the usual care.

Every moving part on U. S. Car Washing Equipment is all-enclosed and continuously bathed in oil. The one hand, pistol grip gun allows any range of pressure from a fine, harmless, completely atomized mist, to a powerful 300 pound gusher. Costs less; uses less power.

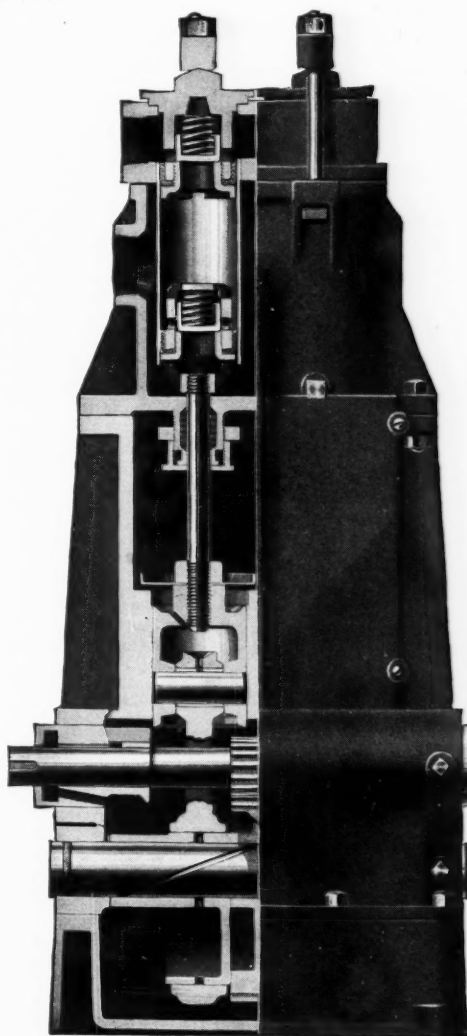
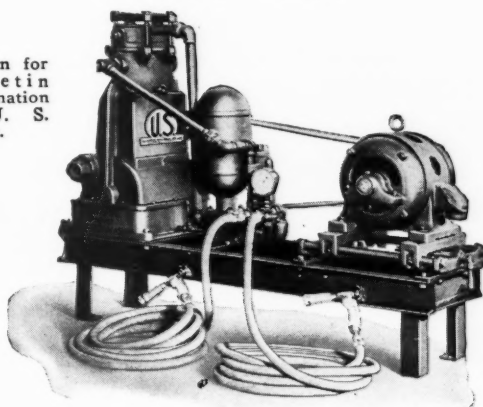
U. S. Car Washing Equipment is shipped ready for immediate operation.

The manufacturers of this Hydraulic High Pressure Unit have recently announced a new continuous duty, self-contained automatic unit equipped with 1½ H.P. motor, which is a "Big Brother" to the famous "Standard DeLuxe," it furnishes ample air for cleaning motors, spraying springs, blowing carbon, and other shop requirements in addition to tire inflation.

**The United States Air Compressor Company**  
5304 Harvard Avenue, Cleveland, Ohio

Export Dept., 615 Fisk Building,  
New York, N. Y.  
Cable Address: "Mawsonne"

Mail the coupon for  
illustrated bulletin  
and full information  
on modern U. S.  
Equipment.



**U. S. CAR WASHING  
EQUIPMENT AW-2**

A high pressure, Pistol Grip, two gun unit, all-enclosed, self-oiling, which furnishes a continuous pressure of 300 pounds or a soft harmless mist.

The  
United  
States Air  
Compressor  
Company,  
5304 Harvard Ave.,  
Cleveland, Ohio

Gentlemen:  
Send me your latest bulletin on U. S. Equipment.

Name .....

Address .....

Jobbers Name .....

Jobbers Address .....

Interested in Car Wash Equipment.....

Paint Spray Units.....

(Please check) Air Compressors.....

**AIR COMPRESSORS  
CAR WASHING UNITS  
PAINT SPRAY EQUIPMENT**

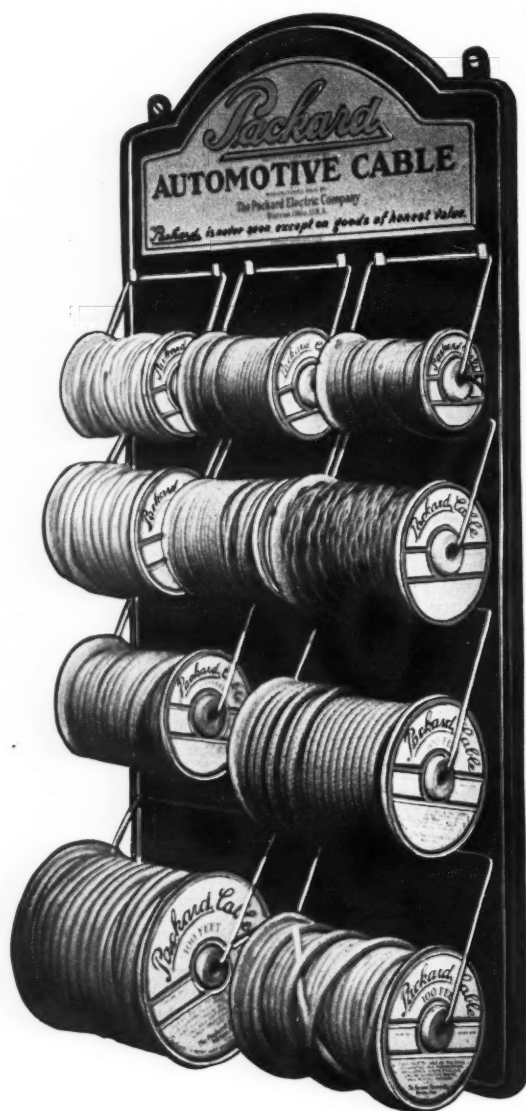
**U. S.**

# CABLE ASSORTMENTS

Packard Radio Cable is a companion line of Packard Automotive Cable. It is sold by assortments with the same style of merchandisers as herewith illustrated.

Completely assembled battery wiring harnesses and complete aerial ground kits come in neat attractive shelf packages. If you handle radios, you should by all means investigate the Packard Radio Cable Line.

Ask your Jobber or write direct for full information.



PACKARD DE LUXE MERCHANDISER



PACKARD STANDARD MERCHANDISER

**E**VIDENCE is being received daily of the fact that the trade is rapidly awakening to the possibilities for profit in the rewiring of motor cars. However, there are many otherwise good business men in the industry who are making practically no effort to cash in on these possibilities.

Packard Cable is a profitable line to handle and re-wiring service is a business-building feature of the up-and-coming service station.

**THE PACKARD ELECTRIC COMPANY, Warren, Ohio**

*Packard is never seen, except on goods of honest value*